

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment						Work Assignment Number 3-50				
						<input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:				
Contract Number EP-C-13-039			Contract Period 09/11/2013 To 07/31/2017 Base Option Period Number 3			Title of Work Assignment/SF Site Name Probabilistic Dose-Response				
Contractor ABT ASSOCIATES INC.					Specify Section and paragraph of Contract SOW Section B.3 paragraph 1					
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input type="checkbox"/> Work Plan Approval					Period of Performance From 09/14/2016 To 07/31/2017					
Comments: The purpose is to initiate Work Assignment 3-50. The contractor shall submit an estimated workplan and an estimated budget in accordance with the contract. See attached performance work statement.										
<input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund										
SFO <input type="checkbox"/> Note: To report additional accounting and appropriations date use EPA Form 1900-69A. (Max 2)										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
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Authorized Work Assignment Ceiling										
Contract Period:		Cost/Fee:		LOE:						
09/11/2013 To 07/31/2017				0						
This Action:				350						
Total:				350						
Work Plan / Cost Estimate Approvals										
Contractor WP Dated:				Cost/Fee		LOE:				
Cumulative Approved:				Cost/Fee		LOE:				
Work Assignment Manager Name Chris Dockins						Branch/Mail Code:				
_____ (Signature) (Date)						Phone Number: 202-566-2286				
						FAX Number:				
Project Officer Name Ahmar Siddiqui						Branch/Mail Code:				
_____ (Signature) (Date)						Phone Number: 202-566-1044				
						FAX Number:				
Other Agency Official Name						Branch/Mail Code:				
_____ (Signature) (Date)						Phone Number:				
						FAX Number:				
Contracting Official Name Tammy Adams						Branch/Mail Code:				
TAMMY ADAMS _____ (Signature) (Date)						Phone Number: 513-487-2030				
						FAX Number: 513-487-2545				

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 dnQualifier=0000018417
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WORK ASSIGNMENT

Title: Probabilistic Dose-Response Functions

Contractor: Abt Associates

Contract No.: EP-C-13-039

Work Assignment Number: 3-50

Estimated Period of Performance: Date of issuance to July 31, 2017

Estimated Level of Effort: 350 hours

Work Assignment Contracting Officer's Representative (WACOR):

Chris Dockins

NCEE, 1809T

202-566-2286

202-566-2338

Background and Purpose:

Benefit-Cost Analysis is widely employed in evaluating environmental policies, including those taken under the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA), and is required by Executive Order. The Environmental Protection Agency (EPA) has well-developed tools to conduct health benefits analysis for some toxics where there is sufficient epidemiological data, but for many other contaminants of concern there are fewer tools with which to evaluate the health benefits of exposure reductions. It is therefore important to develop and evaluate new methods for quantifying health risks and outcomes that are consistent and compatible with economic analysis. These methods, once sufficiently developed and assessed, can provide information needed to help make sound and informed decisions on regulating environmental contaminants.

The limitations of current methods and the need for new methods is addressed in Chapter 5 of the National Research Council (NRC) report *Science and Decisions*, entitled "Toward a Unified Approach to Dose-Response Assessment" (NRC, 2009). The NRC concludes in this chapter that "Separation of cancer and noncancer outcomes in dose-response analysis is artificial...The separation not only is scientifically unjustified but leads to undesirable risk-management outcomes, including inadequate attention to noncancer end points, especially in benefit-cost analyses." The NRC also stated that a "probabilistic approach to noncancer assessment, similar to how cancer risks are expressed, would be much more useful in risk-benefit analysis and decision-making." The NRC recommends that test cases be developed in such a way that different conceptual models can be applied in the unified approach.

More recently, the World Health Organization (WHO) International Programme on Chemical Safety (IPCS) published a "Guidance document on evaluating and expressing uncertainty in

hazard characterization” (WHO 2014). The IPCS guidance document elaborates on and updates the general dose-response assessment approaches described in *Science and Decisions*.

The primary purpose of this work assignment (WA) is to secure support in developing test cases as recommended by the NRC, including consideration of methods described in the IPCS guidance document. More specifically, this work assignment is to obtain support to develop a probabilistic dose-response function or probabilistic reference values (i.e., a set of risk-specific doses) for a single chemical or group of chemicals. The goal is to demonstrate the feasibility of probabilistic dose-response and provide better quantification of health effects for use in benefits analyses. The function or functions developed should draw upon existing publications for data on chemical health effects, distributions of uncertainty/adjustment factors, and other parameters.

Under previous work assignments (EP-W-11-003, WA 4-91 and WA 4-115), the contractor conducted a probabilistic risk assessment of health effects from exposure to carbonyl sulfide and tetrachlorobenzene, and for acrolein, and prepared manuscripts describing the analysis. Under that same work assignment the contractor developed memoranda that compare and contrast alternative approaches to probabilistic risk assessment. This prior work is informative, but will not be repeated under the current work assignment.

Tasks and Deliverables:

The WACOR will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the WACOR's comments. All memos, draft comments, summaries and responses, and chapters are to be provided in electronic form using Word and/or Excel/Access, ArcView, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word or pdf versions of Word documents, that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR and will be formatted to be in compliance with the Section 508 Amendment to the Rehabilitation Act of 1973.

Contractor personnel shall at all times identify themselves as Contractor employees and shall not present themselves as EPA employees. Furthermore, they shall not represent the views of the U.S. Government, EPA, or its employees. In addition, the Contractor shall not engage in inherently governmental activities, including but not limited to actual determination of EPA policy and preparation of documents on EPA letterhead.

QUALITY ASSURANCE (QA) REQUIREMENTS

The Contractor shall submit with their technical proposal a written Quality Assurance Project Plan, as this project generates environmental data using models.

Task 1 - Prepare Work Plan

The contractor shall prepare a workplan within 15 calendar days of receipt of a work assignment signed by the Contracting Officer (CO). The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, as well as a detailed cost estimate by task and a staffing plan. The WACOR, the Contract-Level Contracting Officer's Representative (CL-COR), and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the CO's comments, if required.

1. Work plan within 15 calendar days of receipt of work assignment.

Task 2 - Develop probabilistic dose-response function for one or more health endpoints [Contract PWS Section B.3, "Specific Information on Pollutants of Concern," page 10 of 24]

The contractor shall develop one or more probabilistic dose-response functions for health effects of a contaminant of concern. The contaminant will be provided in technical direction by the WACOR, based on the results of work assignments currently nearing completion. The contractor study shall apply techniques consistent with those identified in Chapter 5 of *Science and Decisions*, entitled "Toward a Unified Approach to Dose-Response Assessment" (NRC, 2009), and the WHO/IPCS "Guidance document on evaluating and expressing uncertainty in hazard characterization" (WHO 2014). The contractor shall evaluate available dose-response data for the chosen chemical, and identify health effects that are candidates for quantitative modeling. The contractor shall then develop an analytical plan for employing these methods based on available data. The contractor shall revise the plan as needed based on comments provided by the WACOR.

The analysis should draw upon existing publications for data on chemical health effects, distributions of uncertainty/adjustment factors, and other parameters. The analysis should illustrate how to employ one or more methods to calculate risks for the chosen chemical. The contractor shall draft a report describing the analysis and results, and shall finalize the report based on comments provided by the WACOR.

Deliverables and schedule under Task 2

2a. Analytical plan for conducting case study within 10 weeks of receiving technical direction from WACOR on selected chemical of concern

2b. Revised analytical plan for conducting case study within 2 weeks of comments from WACOR

2c. Draft report within 36 weeks of workplan approval

2d. Final report within 2 weeks of receiving comments from WACOR

Task 3: Revisions to Submitted manuscripts on (1) acrolein and (2) carbonyl sulfide and tetrachlorobenzene. [Contract PWS Section B.3, "Specific Information on Pollutants of

Concern,” page 10 of 24]

Under prior work assignments (EP-W-11-003, WA 4-91 and WA 4-115) the contractor performed analysis and drafted two manuscripts for publication, “Carbonyl Sulfide and Tetrachlorobenzene Case Studies Comparing Two Human Health Noncancer Risk Assessment Models: BMDS and Straw Man,” and “Applying the ‘Straw Man’ Model to Acrolein.” Under this work assignment the contractor shall revise the document based on peer review comments received and generate a document summarizing responses to those comments.

Deliverables and schedule under Task 3

3a. Revised manuscript for “Carbonyl Sulfide and Tetrachlorobenzene Case Studies Comparing Two Human Health Noncancer Risk Assessment Models: BMDS and Straw Man,” including a summary of the response to comments, within 6 weeks of receiving peer review comments

3b. Revised manuscript for “Applying the ‘Straw Man’ Model to Acrolein,” including a summary of the response to comments, within 6 weeks of receiving peer review comments

Summary of Deliverables and Dates:

1. Work plan within 15 calendar days of receipt of work assignment.

2a. Analytical plan for conducting case study within 10 weeks of receiving technical direction from WACOR on selected chemical of concern

2b. Revised analytical plan for conducting case study within 2 weeks of comments from WACOR

2c. Draft report within 36 weeks of workplan approval

2d. Final report within 2 weeks of receiving comments from WACOR

3a. Revised manuscript for “Carbonyl Sulfide and Tetrachlorobenzene Case Studies Comparing Two Human Health Noncancer Risk Assessment Models: BMDS and Straw Man”, including a summary of the response to comments, within 6 weeks of receiving peer review comments

3b. Revised manuscript for “Applying the ‘Straw Man’ Model to Acrolein”, including a summary of the response to comments, within 6 weeks of receiving peer review comments

References

National Research Council (NRC). *Science and Decisions: Advancing Risk Assessment*. National Academies Press, Washington, DC. 2009

World Health Organization (WHO). *Guidance Document on Evaluating and Expressing Uncertainty in Hazard Characterization*. Geneva, Switzerland: International Programme on Chemical Safety (IPCS). 2014

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Contract Number EP-C-13-039		Contract Period 09/11/2013 To 07/31/2017 Base Option Period Number 3		Title of Work Assignment/SF Site Name Probabilistic Dose-Response Fu			
Contractor ABT ASSOCIATES INC.				Specify Section and paragraph of Contract SOW B.3 Specific information on Pollutants of Concern			
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input checked="" type="checkbox"/> Work Plan Approval				Period of Performance From 09/14/2016 To 07/31/2017			
Comments:							
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Note: To report additional accounting and appropriations data use EPA Form 1900-69A.							
SFO <input type="checkbox"/> (Max 2)							
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars) (Cents) Site/Project (Max 8) Cost Org/Code
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09/11/2013 To 07/31/2017							
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Total:		\$47,318.00		350			
Work Plan / Cost Estimate Approvals							
Contractor WP Dated: 09/30/2016		Cost/Fee \$47,318.00		LOE: 350			
Cumulative Approved:		Cost/Fee \$47,318.00		LOE: 350			
Work Assignment Manager Name Chris Dockins						Branch/Mail Code:	
<div style="display: flex; justify-content: space-between;"> <div>_____ (Signature)</div> <div>_____ (Date)</div> </div>						Phone Number: 202-566-2286	
						FAX Number:	
Project Officer Name Ahmar Siddiqui						Branch/Mail Code:	
<div style="display: flex; justify-content: space-between;"> <div>_____ (Signature)</div> <div>_____ (Date)</div> </div>						Phone Number: 202-566-1044	
						FAX Number:	
Other Agency Official Name						Branch/Mail Code:	
<div style="display: flex; justify-content: space-between;"> <div>_____ (Signature)</div> <div>_____ (Date)</div> </div>						Phone Number:	
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Contracting Official Name Tammy Adams						Branch/Mail Code:	
<div style="display: flex; justify-content: space-between;"> <div> TAMMY ADAMS <small>Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.10.13 13:21:36 -04'00'</small> </div> <div>_____ (Signature)</div> <div>_____ (Date)</div> </div>						Phone Number: 513-487-2030	
						FAX Number: 513-487-2545	

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment						Work Assignment Number 3-51				
						<input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:				
Contract Number EP-C-13-039			Contract Period 09/11/2013 To 07/31/2017 Base Option Period Number 3			Title of Work Assignment/SF Site Name Valuation of Health Effects				
Contractor ABT ASSOCIATES INC.					Specify Section and paragraph of Contract SOW Section A.2.2, page 6 of 24					
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input type="checkbox"/> Work Plan Approval					Period of Performance From 09/14/2016 To 07/31/2017					
Comments: The purpose is to initiate Work Assignment 3-51. The contractor shall submit an estimated workplan and an estimated budget in accordance with the contract. See attached performance work statement.										
<input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund										
SFO <input type="checkbox"/> Note: To report additional accounting and appropriations date use EPA Form 1900-69A. (Max 2)										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
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Authorized Work Assignment Ceiling										
Contract Period:		Cost/Fee:				LOE: 0				
09/11/2013 To 07/31/2017										
This Action:						600				
Total:						600				
Work Plan / Cost Estimate Approvals										
Contractor WP Dated:				Cost/Fee		LOE:				
Cumulative Approved:				Cost/Fee		LOE:				
Work Assignment Manager Name Chris Dockins						Branch/Mail Code:				
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;">(Signature)(Date)</div>						Phone Number: 202-566-2286				
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Project Officer Name Ahmar Siddiqui						Branch/Mail Code:				
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Contracting Official Name Tammy Adams						Branch/Mail Code:				
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;">(Signature)(Date)</div>						Phone Number: 513-487-2030				
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WORK ASSIGNMENT

Title: Valuing Birth Outcomes and Health Effects

Contractor: Abt Associates

Contract No.: EP-C-13-039

Work Assignment Number: 3-51

Estimated Period of Performance: Date of issuance to July 31, 2017

Estimated Level of Effort: 600 hours

Key EPA Personnel:

Work Assignment Contracting Officer's Representative (WACOR):

Chris Dockins
OP/NCEE, 1809T
202-566-2286
202-566-2338

Background and Purpose:

The purpose of this work assignment (WA) is to secure support in estimating values for adverse birth outcomes, particularly preterm birth and reductions in birthweight, for use in economic benefits analysis. These birth outcomes are associated with a number of contaminants in water and other media, including lead. Under a previous work assignment (EP-W-11-003, WA 4-91), the contractor developed draft cost-of-illness values for reduced birthweight and preterm birth. This work assignment seeks to complete the development of these values so that they may undergo external peer review. No work performed under this work assignment will duplicate work performed under previous work assignments.

The work assignment also secures support for developing values for other health endpoints based on Environmental Protection Agency (EPA or Agency) needs and technical direction from the WACOR. These tasks are described more completely below.

Tasks and Deliverables:

The WACOR will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the WACOR's comments. All memos, draft comments, summaries and responses, and chapters are to be provided in electronic form using Word and/or Excel/Access, ArcView, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word or pdf versions of Word documents, that are intended to be shared with management or the

public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR and will be formatted to be in compliance with the Section 508 Amendment to the Rehabilitation Act of 1973.

Contractor personnel shall at all times identify themselves as Contractor employees and shall not present themselves as EPA employees. Furthermore, they shall not represent the views of the U.S. Government, EPA, or its employees. In addition, the Contractor shall not engage in inherently governmental activities, including but not limited to actual determination of EPA policy and preparation of documents on EPA letterhead.

QUALITY ASSURANCE (QA) REQUIREMENTS

The Contractor shall submit with their technical proposal a written Quality Assurance Project Plan, as this project generates environmental data using models.

Task 1 - Prepare Work Plan

The contractor shall prepare a work plan within 15 calendar days of receipt of a work assignment signed by the Contracting Officer (CO). The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, detailed cost estimate by task and a staffing plan. The WACOR, the Contract-Level Contracting Officer's Representative (CL-COR), and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the CO's comments, if required.

Deliverables and schedule under Task 1

1. Workplan within 15 calendar days of receipt of work assignment.

Task 2 - Cost-of-Illness Studies for adverse birth outcomes [Contract PWS Section A.2.2, page 6 of 24]

Under a previous work assignment, 3-75 (contract EP-W-11-003), the contractor produced draft estimates of the cost of illness for reduced birth weight and for preterm birth. The contractor shall complete and finalize cost-of-illness for reduced birth weight and preterm birth, responding to comments provided by the WACOR, and from peer review. The contractor shall provide a report suitable for peer review detailing the analysis and results. This report may be in the form of a manuscript suitable for publication in an appropriate peer-reviewed journal. Upon receiving any comments from external peer reviewers, conveyed as technical direction from the WACOR, the contractor shall revise the report.

Deliverables and schedule under Task 2

- 2a. Draft report on cost-of-illness estimates within 12 weeks of work plan initiation**
- 2b. Revised report within 2 weeks of receiving comments from WACOR**
- 2c. Revised report based on comments from external peer review within 12 weeks of receiving these comments from the WACOR**

Task 3 - Valuation estimates for health outcomes [Contract PWS Section A.2.2, page 6 of 24]

The contractor shall conduct analysis to estimate the cost-of-illness and/or the revealed willingness to pay for other birth-related and developmental health effects arising from exposure to toxic chemicals. Specific health endpoints will be identified in technical direction from the WACOR. The contractor shall first provide a memorandum describing the analytic plan based on available data and methods, and shall revise the plan based on comments provided by the WACOR. The contractor shall then undertake the analysis and provide a report describing the analysis and results. The report will be revised based on comments provided by the WACOR.

Deliverables and schedule under Task 3

- 3a. Draft analytic plan memorandum within 6 weeks of receiving technical direction from WACOR**
- 3b. Revised analytic plan memorandum within 2 weeks of receiving technical direction from WACOR**
- 3c. Draft report on valuation estimates within 12 weeks of revised analytic plan**
- 3d. Revised report within 4 weeks of receiving technical direction from WACOR**

Summary of Deliverables and Dates:

- 1. Work plan within 15 calendar days of receipt of work assignment.**
- 2a. Draft report on cost-of-illness estimates within 12 weeks of work plan initiation**
- 2b. Revised report within 2 weeks of receiving comments from WACOR**
- 2c. Revised report based on comments from external peer review within 12 weeks of receiving these comments from the WACOR**
- 3a. Draft analytic plan memorandum within 6 weeks of receiving technical direction from WACOR**
- 3b. Revised analytic plan memorandum within 2 weeks of receiving technical direction from WACOR**
- 3c. Draft report on valuation estimates within 12 weeks of revised analytic plan**
- 3d. Revised report within 4 weeks of receiving technical direction from WACOR**

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment						Work Assignment Number 3-51			
						<input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:			
Contract Number EP-C-13-039		Contract Period 09/11/2013 To 07/31/2017 Base Option Period Number 3		Title of Work Assignment/SF Site Name Valuing Birth Outcomes and Hea					
Contractor ABT ASSOCIATES INC.				Specify Section and paragraph of Contract SOW Section A.2.2					
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input checked="" type="checkbox"/> Work Plan Approval				Period of Performance From 09/14/2016 To 07/31/2017					
Comments:									
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Note: To report additional accounting and appropriations date use EPA Form 1900-69A.									
SFO <input type="checkbox"/> (Max 2)									
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars) (Cents)	Site/Project (Max 8)	Cost Org/Code
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Contract Period:		Cost/Fee: \$0.00		LOE: 0					
09/11/2013 To 07/31/2017									
This Action:		\$66,124.00		600					
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Work Plan / Cost Estimate Approvals									
Contractor WP Dated:		09/30/2016		Cost/Fee \$66,124.00		LOE: 600			
Cumulative Approved:				Cost/Fee \$66,124.00		LOE: 600			
Work Assignment Manager Name Chris Dockins						Branch/Mail Code:			
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						FAX Number:			
Project Officer Name Ahmar Siddiqui						Branch/Mail Code:			
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Other Agency Official Name						Branch/Mail Code:			
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Contracting Official Name Tammy Adams						Branch/Mail Code:			
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						FAX Number: 513-487-2545			

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EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment		Work Assignment Number 3-53								
		<input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:								
Contract Number EP-C-13-039		Contract Period 09/11/2013 To 07/31/2017 Base Option Period Number 3								
Contractor ABT ASSOCIATES INC.		Title of Work Assignment/SF Site Name Urban Waste Tech Asst								
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input type="checkbox"/> Work Plan Approval		Period of Performance From 08/31/2016 To 07/31/2017								
Comments:										
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SFO (Max 2) <input type="text"/> Note: To report additional accounting and appropriations date use EPA Form 1900-69A.										
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Contract Period:		Cost/Fee:		LOE:						
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Total:				8,116						
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Cumulative Approved:				Cost/Fee		LOE:				
Work Assignment Manager Name Thomas Frankiewicz						Branch/Mail Code:				
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						FAX Number:				
Project Officer Name Ahmar Siddiqui						Branch/Mail Code:				
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						FAX Number:				
Contracting Official Name Tammy Adams						Branch/Mail Code:				
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%; border-bottom: 1px solid black; text-align: center;">(Signature)</div> <div style="width: 45%; border-bottom: 1px solid black; text-align: center;">(Date)</div> </div>						Phone Number: 513-487-2030				
						FAX Number: 513-487-2545				

WORK ASSIGNMENT

I. Title: Urban Waste Technical Assistance and Network Support

Contractor: Abt Associates

Contract No.: EP-C-13-039

II. Work Assignment Number: 3-53

III. Estimated Period of Performance: Date of Issuance through July 31, 2017

IV. Estimated Level of Effort: 8,116 hours

V. Key EPA Personnel:

Work Assignment Contracting Officer's Representative (WACOR):

Tom Frankiewicz
OAR/OAP/CCD (4353TT)
202/343-9232

Alternate Work Assignment Contracting Officer's Representative:

Chris Voell
OAR/OAP/CCD (4353WW)
202/ 343-9468

VI. Background and Purpose:

The 1972 Clean Water Act (CWA) directs the Environmental Protection Agency (EPA or Agency) to develop national technology-based regulations for categories of industries that discharge pollutants directly to surface waters (effluent guidelines) or that discharge pollutants indirectly through sewage treatment plants (pretreatment standards). The CWA also directs EPA to develop national technology-based regulations for new industrial facilities (new source performance standards).

Under Executive Orders 12866 and 13563, EPA is required to estimate the potential benefits and costs to society. As such, the purpose of this Work Assignment (WA) is to provide capacity building, technical assistance and tool support and development to cities to improve waste management and support networks of cities cooperating on improved waste management, including some of the following:

- **Multimedia analysis** of treatment and disposal options for the reduction of open dumping, diversion of organic waste from disposal sites, and improving the design and operations of disposal sites to prevent the migration of leachate into groundwater, air and greenhouse gas emissions.
- **Pollution prevention:** exploring options for organics diversion and treatment to avoid water and air pollution issues associated with dumpsites.

- **Economic market incentives:** to assist partners in evaluating and developing financing and cost recovery tools and policies to improve urban waste management.
- **Environmental benefit analysis:** including but not limited to environmental assessment, pre-feasibility assessments, and estimation of monetized and non-monetized benefits to improve solid waste management especially as it relates to groundwater and surface water protection. Examples include assisting partners in evaluating the potential benefits of leachate control from improved landfill design or operations. Partners may also benefit from assessment of potential air pollutant or greenhouse gas emission reductions from improved solid waste management: for example, by reducing the amount of organic waste deposited in landfills.

EPA is a lead partner in the United Nations Environment Program (UNEP) Climate and Clean Air Coalition (CCAC) Municipal Solid Waste Initiative (MSWI). The overarching goal of the MSWI is to enable cities, with the support of their regional and national governments, to move along the solid waste management hierarchy in a coordinated and cohesive manner in order to mitigate emissions, especially methane and black carbon. The initiative is flexible and takes into account the different needs of cities to reach an optimal waste management system based on their specific circumstances, including the need to address groundwater contamination from leachate.

Since 2012, participating cities and countries have come together to share their experience and expertise through peer-to-peer partnerships (e.g., sister city pairings), regional workshops to disseminate best practise, and a web-based knowledge-sharing platform to reach a global audience. The purpose of this assignment is to support EPA in its role as a lead partner of the initiative, including capacity building activities in India.

Under this work assignment the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA approved quality assurance project plan (QAPP) that was based on Task 2 QAPP language. The QAPP shall describe the procedures for assuring the quality of the primary and secondary environmental and economic data used for this work assignment.

In carrying out the tasks specified in this work assignment, the contractor may be called on to build upon and continue work performed under orders EP-B31H-0014 and No. EP-B14H-0016, issued under Contract No. GS-10F-0299K, BPA No. EP-BPA-12-H-0024. The work performed under this work assignment will not duplicate work conducted under the previously listed orders.

VII. General Requirements of the Work Assignment and Schedule

Confidential Business Information: During the course of the work assignment, the contractor will not be accessing and evaluating CBI.

Budget Reporting: The contractor must also report to the EPA WACOR when 75 percent of the approved Work plan budget has been depleted.

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be clearly identified as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor shall refer all interpretations of policy to the EPA WACOR.

Limitation of Contractor Activities: The contractor shall submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts will clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor shall incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR. The contractor shall adhere to all applicable EPA management control procedures as implemented by the EPA Contracting Officer (CO), EPA Contract level Contracting Officer's Representative (CL-COR), and EPA WACOR.

Quick Response: Under this Performance Work Statement (PWS), the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working days.

Travel: The contractor shall be required to travel under this work assignment. Travel may be to participate with EPA in on site data collection, in meetings with trade associations, and to meet with EPA to discuss methodology and other important issues associated with the project. A request for approval for any travel directly chargeable to this work assignment must be submitted and approved by the CL-COR before travel begins.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters are to be provided in electronic form using Word and/or Excel/Access, ArcView, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word or pdf versions of Word documents, that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR and will be formatted to be in compliance with the Section 508 Amendment to the Rehabilitation Act of 1973.

VIII. Performance Work Statement

The EPA WACOR will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the EPA WACOR's comments.

Task 1 - Prepare Work Plan

The contractor shall prepare a work plan within 15 calendar days of receipt of the work assignment. The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the CL-COR, and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the CO's comments, if required.

Deliverable	Projected Schedule Date
Work Plan	Within 15 calendar days of receipt of work assignment

Task 2 - Quality Assurance

Under this work assignment, the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA approved quality assurance (QA) project plan. Because this work assignment requires the contractor to collect or use environmental or economic data, a Quality Assurance Project Plan (QAPP) is required. The QAPP shall describe the procedures for assuring the quality of the primary and secondary environmental and/or economic data used for the work assignment.

Deliverable	Projected Schedule Date
QAPP	Within 15 calendar days after submittal of the Work Plan
Revised QAPP reflecting EPA comments, if needed	Within 10 calendar days of receipt of EPA comments
Monthly reports of QA work performed (may be included in the Contractor's monthly progress report)	Monthly throughout the WA period of performance

Task 3 - Prepare Standardized Naming Convention and Version Control Memorandum

The contractor shall prepare and submit a memorandum that proposes a standardized naming convention and version control (SNCVC) for all deliverables associated with the WA. This system will ensure that deliverables are clearly named and dated and that the sequence of versions of a document is clear. The EPA WACOR will review the memorandum and then provide the contractor with written notification of approval or edits that need to be made. The contractor shall prepare a revised SNCVC memorandum incorporating the EPA WACOR's comments, if required. After receiving notification of approval the contractor shall use this standardized convention for all deliverables associated with the work assignment(s). The EPA WACOR may request the contractor through written technical direction to amend the SNCVC memorandum at any point during the WA.

Deliverable	Projected Schedule Date
SNCVC memorandum	Within 7 calendar days of Work Plan approval
Revised SNCVC memorandum, if needed	Within 3 calendar days of receipt of EPA comments

Task 4 – Technical Assistance

EPA is a lead partner of the CCAC MSWI. As a lead partner, EPA supports cities in developing countries in improving their solid waste management to address local environmental conditions as well as global climate change. While the nature of the work will vary from city to city, the type of assistance offered is expected to fall within the following categories: collection, recycling, waste diversion, composting, anaerobic digestion, landfill gas energy, closing dump sites, engineered sanitary landfills, management and leadership, and sustainable financing.

The contractor shall support capacity building and knowledge exchanges where U.S. government and other stakeholders from the waste sector exchange information with local experts on key issues affecting short lived climate pollutants (SLCPs) across the waste sector. It is not expected that the contractor will have to develop all original materials. It is, in fact, preferable to leverage other existing materials and models from other Initiative implementers and partners such as United Nations Environment Program - International Environmental Technology Centre (UNEP-IETC), International Solid Waste Association (ISWA) and World Bank.

While EPA will be the lead in working with cities on assessing waste treatment options in some cases, it will often be providing support to other lead implementers. In some cases, assistance will be on an ad hoc bases or on discreet projects, such as providing onsite training on landfill remediation or closure. In other cases, the work will be on an on-gong basis. For example, given the priority set by the CCAC on improving waste management in India, EPA will be providing ongoing technical assistance, assessment and training to a network of cities in India. The technical assistance will include technical working sessions to design and implement proper

waste management techniques; onsite field training to identify and address problems; site visits to waste management facilities in the U.S. and other countries; and development of online training modules.

Deliverable	Projected Schedule Date
4 technical working sessions	2 within six months of work plan approval and 2 within 8 months of work plan approval
2 onsite field training	Within 6 months of work plan approval
Site visit to U.S. waste management facilities	Within 8 months of work plan approval
4 online training modules tailored for India	Within 8 months of work plan approval

Task 5 – Environmental and Economic Assessment

Analysis and pre-feasibility assessments will include but not be limited to environmental assessment, pre-feasibility assessments, and estimation of monetized and non-monetized benefits to improve solid waste management especially as it relates to groundwater and surface water protection. Examples include assisting partners in evaluating the potential benefits of leachate control from improved landfill design or operations.

The contractor shall prepare studies that will be used to assess technical and economic feasibility of specific projects that will achieve quantifiable emissions reductions. Not every project will be able to receive the full level of effort of a pre-feasibility study, so it is expected that two to three studies will be performed for cities that either highlight specific types of projects such as landfill gas energy project or the market for certain kinds of waste handling processes such as composting of green waste or small-scale anaerobic digestion of market waste.

The contractor shall compile tools and resources to support and augment the capacity building activities. The development of these tools and resources will allow cities to become aware of the latest methods to improve municipal solid waste (MSW) management and to mitigate emissions from the waste sector. The tools and resources will draw on existing resources developed by the EPA, the Global Methane Initiative, C40, the World Bank, and other leading experts in the international waste sector, but will be customized for use under the MSWI. For example, the SLCP baseline emissions estimation tool and the economics of organics management tool developed for EPA shall be updated with current information and will also be made user friendly for audiences in developing countries.

Deliverable	Projected Schedule Date
4 prefeasibility studies	1 within six months of work plan approval and 1 within 8 months of work plan approval
Updated emissions estimation tool	Within 4 months of work plan approval
Updated economics of organics tool	Within 4 months of work plan approval

Financing tool	Within 8 months of work plan approval


Task 6 – Communication and Outreach

Outreach, publications, and conference participation are essential in communicating technical, environmental, and economic information developed under this assignment. The contractor shall be expected to represent the initiative at various internal and external CCAC coordination meetings and activities that will include CCAC partners such as United Nations Environment Program, World Bank and other governmental and non-government organizations. The contractor should be well-versed in the issues of climate, environment, and integrated solid waste management and have extensive past experience working with cities on the implementation of climate and environment activities in developing and developed countries.

The contractor shall engage in a broad range of communication activities to support outreach within the CCAC framework. These activities will augment outreach to stakeholders and cities' success stories, best practices and other lessons learned through a variety of media and forums, forge partnerships, and generate feedback to improve the ability of the Coalition to meet the needs of implementing partners. Examples of activities to facilitate the exchange of information between solid waste officials and city leaders include attending technical information sessions, one-on-one stakeholder meetings, and international waste information exchanges; support for mentor cities, developing and disseminating reports, case studies, sector papers, fact sheets, and country and/or regional profiles and other materials that advance consideration of SLCPs in the waste sector; and presenting at private, public, institutional sponsored forums, including government-to-government meetings, technical workshops, and other venues. The development and delivery of activities will be closely coordinated within the CCAC framework. This coordination and interaction will determine the overall extent and number of communication activities for which the MSWI provides support.

Deliverable	Projected Schedule Date
Facilitation of the CCAC session at ISWA Congress (September 21-22, 2016)	Within two weeks of session completion
6 fact sheets	Within 9 months of work plan approval
2 case studies on best practices	Within 8 months of work plan approval
2 presentations	Within 8 months of work plan approval
1 paper for peer reviewed publication	Within 8 months of work plan approval

Work Assignment Form. (WebForms v1.0)

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment						Work Assignment Number 3-54				
						<input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:				
Contract Number EP-C-13-039			Contract Period 09/11/2013 To 07/31/2017 Base Option Period Number 3			Title of Work Assignment/SF Site Name Environmental Impact Support f				
Contractor ABT ASSOCIATES INC.					Specify Section and paragraph of Contract SOW B.1, B.3, B.4, C.1, G					
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input type="checkbox"/> Work Plan Approval					Period of Performance From 11/28/2016 To 07/31/2017					
Comments:										
<div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund </div>										
Note: To report additional accounting and appropriations data use EPA Form 1900-69A.										
SFO <input type="checkbox"/> (Max 2)										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										
Authorized Work Assignment Ceiling										
Contract Period:		Cost/Fee:		LOE:						
09/11/2013 To 07/31/2017				0						
This Action:				460						
Total:				460						
Work Plan / Cost Estimate Approvals										
Contractor WP Dated:				Cost/Fee		LOE:				
Cumulative Approved:				Cost/Fee		LOE:				
Work Assignment Manager Name Emily Trentacoste <div style="display: flex; justify-content: space-between;"> <div>_____ (Signature)</div> <div>_____ (Date)</div> </div>						Branch/Mail Code: Phone Number: 202-566-0703 FAX Number:				
Project Officer Name Ahmar Siddiqui <div style="display: flex; justify-content: space-between;"> <div>_____ (Signature)</div> <div>_____ (Date)</div> </div>						Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:				
Other Agency Official Name <div style="display: flex; justify-content: space-between;"> <div>_____ (Signature)</div> <div>_____ (Date)</div> </div>						Branch/Mail Code: Phone Number: FAX Number:				
Contracting Official Name Tammy Adams <div style="display: flex; justify-content: space-between;"> <div>  Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.11.28 16:49:57 -05'00' _____ (Signature) (Date) </div> <div> Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.11.28 16:49:57 -05'00' _____ (Signature) (Date) </div> </div>						Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545				

WORK ASSIGNMENT

I. Title: Environmental Impact Support for the Study of Centralized Waste Treatment

Contractor: Abt Associates

Contract No.: EP-C-13-039

II. Work Assignment Number: 3-54

III. Estimated Period of Performance: Date of issuance through July 31, 2017

IV. Estimated Level of Effort: 460 hours

V. Key EPA Personnel:

Work Assignment Contracting Officers Representative (WACOR):

Emily Trentacoste
OST/EAD (4303T)
202-566-0703
202-566-1053 (fax)

VI. Background and Purpose:

The 1972 Clean Water Act (CWA) directs the Environmental Protection Agency (EPA or Agency) to develop national technology-based regulations for categories of industries that discharge pollutants directly to surface waters (effluent guidelines) or that discharge pollutants indirectly through sewage treatment plants (pretreatment standards). The CWA also directs EPA to develop national technology-based regulations for new industrial facilities (new source performance standards).

Recent advances in horizontal drilling and hydraulic fracturing have made the extraction of natural gas from coal bed, shale, and tight sands formations more technically and economically feasible than in past decades. These advanced (or unconventional) drilling techniques coupled with large gas reserves in rock formations around the country, have resulted in dramatic increases in the number of wells being drilled and hydraulically fractured in the United States (U.S.). As the number of unconventional gas wells in the U.S. increases, so too does the volume of wastewater that requires disposal. Wastewater associated with oil and gas (O&G) extraction can contain high total dissolved solids (TDS), fracturing fluid additives, metals, and naturally occurring radioactive materials (NORM).

While many wastewaters are recycled and reused by producers, treatment and discharge is needed in certain cases. Where these wastewaters are being managed for treatment and discharge at Centralized Waste Treatment (CWT) facilities, there is the potential for discharge of pollutants of concern to waters of the United States. Some CWT facilities that are accepting these wastewaters, or may potentially accept these wastewaters in the future, may not have advanced treatment in place that is amenable to removal of the pollutants of concern. For these reasons, in

the preliminary 2014 304m Plan, EPA announced that it is performing a study on the CWT industry. The study will evaluate the full spectrum of wastewater management practices at CWT facilities accepting O&G gas extraction wastewaters, including treatment and discharge, recycling, zero discharge, barrel-in/barrel-out, etc.

Under Executive Orders 12866 and 13563, EPA is required to estimate the potential benefits and costs to society. As such, the purpose of this Work Assignment (WA) is to provide contractor tasks to support EPA's completion of the CWT study, and specifically to provide support for the examination of environmental impacts associated with CWT acceptance of O&G extraction wastewaters.

Under this work assignment the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA approved programmatic quality assurance project plan (PQAPP) that was developed for Contract EP-C-13-039. The PQAPP describes the procedures for assuring the quality of the secondary environmental data used for this work assignment.

In carrying out the tasks specified in this work assignment, the contractor may be called upon to build upon and continue work performed under WA 2-06, WA 1-10 under Contract EP-C-13-039 and WA 5-30 under Contract EP-C-07-023. The work performed under this work assignment will not duplicate work conducted under the previous work assignments.

Under the previous work assignments, Abt Associates performed the following analyses:

- Preliminary summary of available literature on documented and potential environmental impacts from treated oil and gas wastewater discharged by CWTs;
- Draft summary of total dissolved solids impacts to water uses;
- Preliminary summary of available data on discharges of radionuclides in CWT effluent;
- Summary of radionuclide limits and monitoring requirements in CWT National Pollutant Discharge Elimination System (NPDES) permits;
- Analysis of state and national regulations on disposal of radioactive treatment residuals;
- Summary of available literature on volatile organic compounds from oil and gas wastewater;
- Literature review of drinking water impacts from treated oil and gas wastewater discharged by CWTs.

VII. General Requirements of the Work Assignment and Schedule

Confidential Business Information: During the course of the work assignment, the contractor is not expected to access and evaluate CBI.

Budget Reporting: The contractor under this work assignment is required to report to the EPA WACOR and Contract-Level Contracting Officers Representative (CL-COR) when 75 percent of the total work assignment funding amount has been depleted. The contractor must also report to the EPA WACOR when 75 percent of the approved work plan budget has been depleted.

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be clearly identified as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor shall refer all interpretations of policy to the EPA WACOR.

Limitation of Contractor Activities: The contractor shall submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts will clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor shall incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR. The contractor shall adhere to all applicable EPA management control procedures as implemented by the EPA Contracting Officer (CO), EPA CL-COR, and EPA WACOR.

Quick Response: Under this Performance Work Statement the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working days.

Travel: EPA does not anticipate the need for non-local travel by contractor employees and/or subcontractors to support the scope of this work assignment.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters are to be provided in electronic form using Word and/or Excel/Access, ArcView, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word or pdf versions of Word documents, that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR and shall be formatted to be in compliance with the Section 508 Amendment to the Rehabilitation Act of 1973.

VIII. Performance Work Statement

The EPA WACOR will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the EPA WACOR's comments.

Task 1 - Prepare Work plan

The contractor shall prepare a work plan within 15 calendar days of receipt of the work assignment. The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the CL-COR and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given

to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the CO's comments, if required.

A weekly update call with the EPA WACOR will be required for this work assignment to discuss progress on deliverables, costs, and other potential issues.

Deliverables and schedule under Task 1

Deliverable	Projected Schedule Date
Work Plan	Within 15 calendar days of receipt of work assignment.

Task 2 Quality Assurance

2.1 Background

QAPPs are required under the Agency's Quality Assurance Policy CIO-2105, formerly EPA Order 5360.1A2 and implementing guidance CIO-2105-P-01-0. All projects that involve the generation, collection, analysis and use of environmental data must have an approved Quality Assurance Project Plan (QAPP) in place prior to the commencement of the work. Examples of these environmental data operations are provided in **Table 2-1** below.

Table 2-1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data.

Item	Examples
Data	Includes field sampling information (sample location information, flow measurements, temperature, pH, physical observations, etc.), laboratory measurements (e.g., chemical, physical, biological, radiological measurements), data collected from questionnaires, economic data, census data, and any other types of existing data (i.e., data generated for a different purpose or generated by a different organization)
Data generation	Includes field studies, laboratory studies, and generation of modeling output
Data collection	Includes field surveys, questionnaire surveys, literature searches, and third party data
Data evaluation	Includes data inspection, review, assessment, and validation
Data analysis	Includes statistical, engineering, and economic analysis, and testing, evaluation, and validation of methods and models; database creation, data extraction and data manipulation
Data Use	Any use of data to support EPA decisions, regulations, policy, publications, or tools (including effluent guidelines, 304(m) program, standards, environmental assessments, and models, tools, or reports disseminated by EPA to assist other organizations in implementing environmental programs)

Note that QAPPs are required for the development or revision of models and software that support the generation, collection, evaluation, analysis, or use of data. (A model is a set of equations and assumptions used to predict unknown data.) When existing models are used as a tool to generate or evaluate data, the project QAPP must describe the model and explain how it will be used and how its output will be evaluated to ensure the modeling effort meets the overall

quality objectives for the project. Development or revision of new models also must be supported by a QAPP that describes the objectives for the model, the quality criteria that will be applied to the model, and the procedures for evaluating whether the model meets those criteria.

2.2 QA Project Plan Requirements

The Contractor has previously prepared a contract-wide Programmatic QAPP (PQAPP) for Contract EP-C-13-039. This PQAPP describes, in a single document, information that is not site or time-specific, but applies throughout the program (i.e., the duration of the contract). When tasked with preparing the PQAPP, the Contractor was informed that the PQAPP may need to be supplemented with project-specific details to support individual work assignments that involve the collection, generation, evaluation, analysis, or use of environmental data.

The activities in this WA involve gathering, evaluating, analyzing, and otherwise using existing environmental data (also known as “secondary” use of data). EPA has determined that the contractor is operating under the existing PQAPP and that the PQAPP addresses QA requirements for this WA. In support of this WA, the contractor shall ensure that the work plan provides enough detail to clearly describe:

- Specific objectives of the project(s) supported by this WA such as researching data sources and models, evaluating and processing data, documenting data processing and quality, assembling, evaluating, and implementing model collections; assessment of model results;
- The type of data to be gathered or used under this WA to support the project objectives—including data from search engines, federal databases, and EPA data bases—as well as a rationale for when those databases are appropriate and what data available in each will support the project;
- The quality objectives needed to ensure the data will support the project objectives; and,
- The quality assurance/quality control (QA/QC) activities to be performed to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.

Table A-1 in the Appendix to this WA demonstrates how the PQAPP addresses QA requirements for this WA.

The contractor shall fill in staff roles to the Table A-1 checklist under Row A.4 and make any additional detailed notes in the ‘explanatory comments’ column as requested by the WACOR, when this information differs from the existing PQAPP (*Programmatic Quality Assurance Project Plan (PQAPP) for Economic, Environmental, and Regulatory Analytical and Evaluation Support for Clean Water Regulations* (Contract No. EP-C-13-039), December 21, 2015, Revision 2). When this information does not differ from the existing PQAPP the contractor should simply cite the PQAPP. The contractor shall then include the completed Table A-1 as a separate Appendix A to the work plan upon submittal to EPA. This Appendix A will be a stand-alone document when QA documentation is required to support EPA regulatory activities, therefore the Table A-1 title must include the title of the WA, WA number, contract number, and what projects each covers. The WACOR has provided this information in the title, which the contractor may use to fulfill this requirement.

2.3 Additional QA Documentation Required

The EPA Quality Manual for Environmental Programs (CIO 2105-P-01-0, May 2000) requires published Agency reports containing environmental data to be accompanied by a readily identifiable section or appendix that discusses the quality of the data and any limitations on the use of the data with respect to their originally intended application. The EPA Quality Manual further requires Agency reports to be reviewed by the QA manager (or other authorized official) before publication to ensure that an adequate discussion of QA and QC activities is included. The purpose of the review is to ensure the reports provide enough information to enable a knowledgeable reader to determine if the technical and quality goals were met for the intended use of the data. Reports should include applicable statements regarding the use of any environmental data presented as a caution about possible misuse of the data for other purposes. For example, a Technical Support Document or Study Report must include a clear discussion of the quality management strategies (including the project goals and objectives, quality objectives and criteria, and QA/QC practices) that were employed to control and document the quality of data generated and used. These documents should also discuss any deviations from procedures documented in the EPA-approved QAPP(s) supporting the project, the reasons for those deviations, any impact of those deviations had on data quality, and steps taken to mitigate data quality issues.

In support of this Agency requirement, all major deliverables (e.g., Technical Support Documents, Study Reports, Analytical Methods) produced by the contractor under this WA must include a discussion of the QA/QC activities that were performed to support the deliverable. This discussion must provide a sufficient level of detail to allow the Engineering and Analysis Division (EAD) QA Coordinator (or designee) to determine whether the QA/QC strategies implemented for the project sufficiently support the intended use of the data. Upon receipt, the EPA WACOR will review each applicable report and certify whether the contractor has adhered to the QA requirements documented in the contractor's PQAPP.

The contractor also shall provide EPA with monthly reports of QA activities performed during implementation of this WA. These monthly QA reports shall identify QA activities performed to support implementation of this WA, problems encountered, deviations from the QAPP, and corrective actions taken. If desired, the contractor may include this report as a part of the contract-required monthly financial/technical progress report.

2.5 Data Quality Act/Information Quality Guidelines Requirements

The Data Quality Act (also known as the Information Quality Act) requires EPA to ensure that influential information disseminated by the Agency is sufficiently transparent in terms of data and methods of analysis that the information is capable of being substantially reproduced. To support compliance with these data transparency/data reproducibility requirements, EPA plans to include QAPPs as part of any rulemaking record documentation to be made available to the public. The Contractor may claim information in QAPPs as confidential; if the Contractor chooses to do so, the Contractor shall submit a sanitized (i.e., public) version and an unsanitized (i.e., confidential) version at the time the QAPP is submitted for approval by EPA. The sanitized

version shall be included in the public docket for the applicable rulemaking (or other docket record), and the unsanitized version shall be included in a non-public (i.e., confidential) portion of the docket (or record).

Information contained in the approved QAPP shall be transparent and reproducible and meet the requirements of the Data Quality Act for influential information. EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency* (EPA/260R-02-008, October 2002), referred to as "EPA's Information Quality Guidelines," describe EPA procedures for meeting Data Quality Act requirements. Section 6.3 of EPA's Information Quality Guidelines indicate that "especially rigorous robustness checks" should be applied in circumstances where quality-related information cannot be disclosed due to confidentiality issues. Where applicable, the contractor should indicate which results were obtained using the tools (standard operating procedures, checklists, and guidelines) that the contractor designates as confidential so that the EPA WACOR can easily identify the areas that shall require rigorous robustness checks and document that those checks have been performed. At the discretion of the EPA WACOR, the contractor may be requested to prepare pre-dissemination review checklist as described in Section 5.5 of the Office of Water Quality Management Plan, March 2015. If this is required, the EPA WACOR will notify the contractor through written technical direction.

2.6 Task 2 QA Deliverables

Deliverable	Projected Schedule Date
Monthly reports of QA work performed (may be included in the Contractor's monthly progress report)	Monthly throughout the WA period of performance

Task 3 - Prepare Standardized Naming Convention and Version Control Memorandum

The contractor shall adhere to the EPA WACOR approved standardized naming convention and version control (SNCVC) plan that was developed under the Construction and Development WA 0-01 of the contract EP-C-07-023 (WA0-01_T1_SNCVC_08.31.07_V1.pdf). The contractor shall use this standardized convention for all deliverables associated with this work assignment.

The EPA WACOR may request the contractor through written technical direction to amend the SNCVC memorandum at any point under this WA. The EPA WACOR will review the revised memorandum and then provide the contractor with written notification of approval or edits that need to be made. The contractor shall prepare the edited SNCVC memorandum incorporating the EPA WACOR's comments, if required. After receiving notification of approval the contractor shall use the revised SNCVC.

Deliverables and schedule under Task 3

Deliverable	Projected Schedule Date
Revised SNCVC memorandum	If required, revised memorandum within 3 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 4 – CWT Study Environmental Impacts Discussion

Task 4.1 – CWT Environmental Impacts Discussion

The contractor shall revise and update the environmental impacts work initiated under Abt Contract EP-C-13-039 and EP-C-07-023 without duplicating those efforts. The contractor shall discuss with and may provide to the EPA WACOR relevant deliverables under these Contracts. The contractor shall consult a variety of existing information sources including journal articles previously compiled and provided by the EPA WACOR, other published literature, peer-reviewed studies, government reports, internet sources, and personal communications with experts.

The contractor's effort shall address current documented and potential environmental impacts from CWT facilities accepting oil and gas wastewaters including qualitative and quantitative characterizations. Topics shall include, but not be limited to:

- Identification of specific constituents of concern in treated oil and gas wastewater and treatment residuals,
- Routes through which identified constituents could interact with the environment and human health,
- Environmental and human health impacts from surface water discharges, discharges to publicly owned treatment works (POTWs), disposal of treatment residuals, land/road spreading and spills,
- Impacts to water quality, aquatic ecosystems, human health, POTW treatment efficiency, beneficial reuse and irrigation,
- Both documented and potential impacts.

The contractor shall identify existing rules, regulations, thresholds or limits at both the national and state level for the constituents of concern identified in Task 4.1 and in previous work under Contract EP-C-13-039 and EP-C-07-023. For some constituents, this work has been completed under WA 2-06 under Contract EP-C-13-039 and should not be duplicated – specifically radionuclides and radiation in both effluent and residual waste. The contractor may use data sources such as national drinking water and aquatic health standards, and publications from government organizations, such as state governments.

As part of the literature review, the contractor shall also identify and summarize 3-5 specific cases of documented impacts. These cases should include examples of impacts on both environment and human health, and of both direct and indirect discharges from CWTs accepting oil and gas wastewater. The contractor and EPA WACOR will discuss these cases for incorporation into written discussion. Written discussions of the cases can be a few paragraphs each (see Steam Electric Power Generating Point Source Category: Final Detailed Study Report, Chapter 6 – Environmental Assessment of Coal Combustion Wastewater for examples; EPA 821-R-09-008).

The contractor shall organize collected documents, information and case studies into an outline to be presented to the EPA WACOR for review and shall incorporate EAP WACOR comments in a revised version. The contractor shall also prepare written materials and discussion summarizing collected information in a memorandum. The memorandum will organize information according to the areas of interest identified in the previously mentioned outline. The memorandum shall be written so as to serve as the basis for the Environmental Impacts chapter in the CWT Study. The memorandum shall be submitted to the EPA WACOR for review and comment and EPA WACOR comments shall be incorporated in the subsequent version of the written summary.

Task 4.2 – Compile & Analyze Concentration Data on Constituents of Concern

Previous review has identified a number of sources including journal articles, government reports, and EPA data collection that contain concentration data on constituents of concern in CWT effluent, receiving streams, receiving stream sediments, and treatment residuals. The contractor shall expand upon work already completed by EPA to compile the existing data from these reports to determine the current or potential levels of these constituents in these media. The contractor shall include in the compilation current thresholds identified in Task 4.1 that exist for these constituents in these media including, but not limited to drinking water criteria, aquatic health criteria, human health criteria (water + organism and organism only) and hazardous waste disposal criteria. For certain constituents, the contractor should incorporate work already concluded under WA 2-06 under Contract EP-C-13-039. These constituents include radionuclides and radioactivity in effluent and residual waste. The contractor shall then compare the concentrations or levels of constituents found in reported data to these thresholds and determine if any thresholds have been exceeded or the potential for exceedances.

The contractor shall compile concentration data from sources used in Task 4.1 including published literature, peer-reviewed studies, government reports, EPA reports, as well as information previously compiled and provided by the EPA WACOR. The contractor shall provide the compiled concentration data, references for these data, and the identified thresholds in a table format, along with a short discussion of the results of the analysis in the form of a memorandum to the EPA WACOR for review and comment. The contractor shall also devise a figure or visual representation of the concentration data and limits. EPA WACOR comments shall be incorporated into the subsequent version of the table, discussion and figure.

Deliverables and schedule under Task 4 CWT Study Environmental Impacts Discussion

Deliverable	Projected Schedule Date
4.1 Draft memo outline	Within 15 days of receipt of written technical direction from EPA WACOR
4.1 Final memo outline	Within 7 days after EPA WACOR submits comments
4.1 Draft discussion memo	Within 30 days after EPA WACOR finalizes final memo outline.

Deliverable	Projected Schedule Date
4.1 Revised draft discussion memo	Within 14 days after EPA WACOR submits comments
4.1 Final draft discussion memo	Within 10 days after EPA WACOR submits comments
4.2 List of constituents with concentration data	Within 15 days of receipt of technical direction from EPA WACOR.
4.2 Draft analysis table and discussion	Within 21 days after EPA WACOR submits comments on constituents list.
4.2 Final draft table and discussion	Within 14 days after EPA WACOR submits comments.

Task 5 – Support for CWT Rulemaking Environmental Assessment Analyses

Task 5.1 – Identification of Models and Analyses

In preparation for the possibility that the CWT category is selected for rulemaking, the contractor shall inventory, identify and analyze potential models that could be used in an environmental assessment to model the fate, transport and impact of constituents of concern identified in the CWT study under current conditions and potential policy options. This work may build off of the previous work completed under WA-2-36 under Contract EP-C-13-039. This previously completed work used the National Ecosystem Services Classification System to identify final ecosystem services that may be potentially impacted from changes to the CWT effluent guidelines. The contractor may use this work to identify final ecosystem services that could be incorporated into models for quantitative analyses in an environmental assessment.

The contractor shall provide a written summary and discussion of the identified models to the EPA WACOR for review and incorporate revisions. Analysis and discussion for each model shall include:

- Specific constituents captured in the model, or proxies for these constituents,
- Nature and availability of input data sets required for model implementation,
- Output data parameters and the potential for these outputs to be used in subsequent analyses such as benefits,
- Appropriate scale at which to conduct the model,
- Time, experience and resource availability constraints for implementing the model,
- Overall assessment of the appropriateness and usefulness of the model in an environmental assessment for CWTs.

Constituents and/or models to incorporate in the analysis and summary may include

- Bromide in receiving streams as it relates to downstream drinking water intakes,
- TDS and/or salinity in receiving streams,
- Other constituents such as metals, ammonia, and radionuclides in receiving streams,

- Human health impacts of any constituents,
- Fish, shellfish or aquatic life impacts including bioaccumulation.

The contractor shall identify other analyses or methods for quantitatively evaluating the environmental fate and impacts from constituents outside of the modeling approach that would be appropriate to incorporate into the environmental assessment. Examples of such analyses could include geographic information systems (GIS) analyses of public drinking water intakes, proximity analyses of 303(d) listed waters and/or Endangered Species Act-listed species, toxicity of wastewater to aquatic species based on ion constitution. Emphasis should be placed on analyses or methodologies that can be applied at a national level. A discussion of these possible other analyses or methodologies should include, but not be limited to:

- The constituents or impact being addressed,
- Nature and availability of input data required to implement analysis,
- Ability to incorporate results of analyses into economic benefits.

The written summary shall be compiled in the form of a memorandum to be provided to the EPA WACOR for comment and revision. The contractor shall incorporate EPA WACOR comments and revisions into the final memorandum.

Task 5.2 – Develop a Draft Environmental Assessment Methodology Outline

Given the potential for revision of the CWT effluent guidelines, the contractor shall develop a draft outline of the environmental assessment methodology and potential components of an environmental assessment of impacts from CWTs accepting O&G wastewater.

The contractor shall incorporate the work completed under Task 5.1 and draw on ongoing discussions with the EPA WACOR, and Environmental Assessments from previous effluent limitation guidelines rulemakings to identify the quantitative and qualitative analyses (including all models) and discussions. The contractor shall either reference previously generated discussions (such as from Task 5.1) or include in the outline the data sources and specific analyses used for each section. The contractor shall include in the outline the specific areas that could be used for potential monetization approaches for benefits.

A draft outline shall be provided to the EPA WACOR for review and comment, and subsequent draft and final outlines shall be prepared by the contractor.

Deliverables and schedule under Task 5 Support for Environmental Assessment Analyses

Deliverable	Projected Schedule Date
5.1 Draft models & analyses memo	Within 40 days of receipt of technical direction from EPA WACOR.
5.1 Final draft models & analyses memo	Within 21 days of submission of comments by EPA WACOR.
5.2 Draft environmental assessment outline	Within 60 days of receipt of technical direction from EPA WACOR.

Deliverable	Projected Schedule Date
5.2 Final draft environmental assessment outline	Within 21 days of submission of comments by EPA WACOR.

Task 6 - Technical Support for the CWT study and Environmental Assessment

The contractor shall provide technical support related to environmental and human health issues associated with the CWT study and/or rulemaking. Such support may include responding to management questions about economic issues, preparing briefing and meeting materials (which may include but are not limited to short briefing documents and PowerPoint presentations). The contractor may also be requested to participate in and/or conduct briefings, assist the EPA WACOR with review of analyses conducted by EPA and its contractors, provide technical review of materials prepared for the rulemaking by Agency staff, and assist in the development of the rulemaking record. Although a precise number of technical support requests cannot be given at this time, EPA expects the number to be between 3 and 5. For the purpose of costing, the contractor should assume that 2 of these requests require quick responses.

The contractor shall prepare draft deliverable material for EPA WACOR review and approval.

Once the EPA WACOR reviews the draft materials and provides revisions and/or comments to the contractor, the contractor shall prepare a final version of the materials incorporating the EPA WACOR's comments.

Deliverables and schedule under Task 6 Technical Support for CWT Study and Environmental Assessment

Deliverable	Projected Schedule Date
6.1 Draft Deliverables	Within 7 calendar days of written technical direction received from the EPA WACOR or as otherwise specified.
6.1 Final Draft Deliverables	If additional edits are required, the draft deliverable must be updated within 7 calendar days of written technical direction received from the EPA WACOR.

Appendix

EAD Checklist for Projects Utilizing Existing Data

The items noted in this checklist are adapted from those elements found in *EPA Requirements for QA Project Plans (QA/R-5)* (EPA, 2001a), but tailored to the use of existing data.

Table A-1. QAPP Elements Applicable to WA 3-54 (Environmental Impact Support for the Study of Centralized Waste Treatment) of Contract EP-C-13-039 for Projects Utilizing Existing Data

QAPP Element	Sufficiently Addressed in PQAPP	Additional Detail Needed in Checklist	Not Applicable to Project	Explanatory Comments
A1. Title & Approval Sheet				
Project title	X			Environmental Impact Support for the Study of Centralized Waste Treatment
Organization's name	X			Abt Associates
Effective date and/or version identifier	X			PQAPP p. ii
Dated signature of Organization's project manager	X			PQAPP p. ii
Dated signature of Organization's QA manager	X			PQAPP p. ii
Other signatures, as needed (e.g., EAD Project Officer, EAD QA Coordinator)	X			PQAPP p. ii
Revision History	X			PQAPP p. ii
A2. Table of Contents				
Includes sections, figures, tables, references, and appendices	X			PQAPP p. vii-viii
Document control information indicated (when required by the EPA Project Manager and QA Manager)	X			
A3. Distribution List				
Includes all individuals who are to implement or otherwise receive the QAPP and identifies their organization	X			PQAPP Section 2.1 p. 5-7
A4. Project/Task Organization				
Identifies key individuals with their responsibilities (e.g., data users, decision makers, project QA manager, Subcontractors, etc.) and contact info.	X	X		Reference PQAPP section 2.1 on page 5. Referencing table 2.1 and descriptions on page 7 of PQAPP. Specific people identified for the following roles: Abt PQA: Abt WAM: EPA WACOR: Emily Trentacoste
Organization chart shows lines of authority & reporting responsibilities	X			PQAPP Section 2.1 p. 5
Project QA manager position indicates independence from unit collecting/using data	X			PQAPP Section 2.1 p. 5

QAPP Element	Sufficiently Addressed in PQAPP	Additional Detail Needed in Checklist	Not Applicable to Project	Explanatory Comments
A5. Problem Definition/Background				
Clearly states problem to be resolved, decision to be made, or hypothesis to be tested	X	X		Section 2.2 – goal of program is to conduct environmental analyses that inform development of ELGs See table 2-2: environmental assessment, collection /preparation of reports, database development and management. The purpose of this work assignment is to provide contractor tasks to support EPA's completion of the CWT study.
Identifies project objectives or goals	X	X		Reference PQAPP Table 2.2; specifically rows with the following analyses titles: Environmental Assessment, Collection/preparation of reports, Database development and management, Outreach
Historical & background information	X			PQAPP Section 2.2
Cites applicable technical, regulatory, or program-specific quality standards, criteria, or objectives	X	X		Section 2.2 – goal of program is to conduct environmental analyses that inform development of ELGs. See Table 2-2 – Environmental Assessment row.
A6. Project/Task Description				
List measurements to be made/data to obtain	X			PQAPP Section 2.3, p. 14 bullets, specifically characteristics of entities that may be affected, characteristics of waterbodies, baseline environmental conditions, information about water pollution control technology, information about value of use and non-use benefits
Notes special personnel or equipment requirements			X	
Provides work schedule	X	X		Work sequences delineated, dates TBD.
A7. Overall Quality Objectives & Criteria				
States overall quality objectives and limits needed to support the project goals and objectives cited in A5	X	X		Section 2.4.1 – Environmental Assessments of PQAPP. See Fig. 2-3 (p. 15) for industry profile and model selection. Existing environmental condition data will be compiled from multiple sources – bullets on p. 16 p PQAPP.
A8. Special Training Requirements/ Certifications				
Identifies specialized skills, training or certification requirements			X	
Discusses how this training will be provided/the necessary skills will be assured and documented			X	
A9. Project-level Documents & Records				
Describes process for distributing the approved QAPP and other planning documents (and updates) to staff	X	X		Section 2 of PQAPP, pages 5-7; see Table 1-2, section A4 for added specific names that correspond to Table 2.1 of the PQAPP.

QAPP Element	Sufficiently Addressed in PQAPP	Additional Detail Needed in Checklist	Not Applicable to Project	Explanatory Comments
Identifies final work products that will result from the project		X		PQAPP Section 2.6: Scoping memorandum, literature review summaries and databases, summary table, briefing slides, draft chapters for final report (i.e. environmental impacts section), electronic files containing existing data are all potential deliverables and will follow the QA review outlined in Table 2-4 of Section 2.6.2 of the PQAPP. EPA WACOR will discuss with contractor the format of memoranda to include specific cases of environmental impacts.
Describes the process for developing, reviewing, approving, and disseminating the final work products and individuals responsible for these processes	X	X		See Appendix A of PQAPP; must be delivered to the EPA WACOR Emily Trentacoste and Abt Assoc identified PQA: _____
B1. Data Needs				
Detailed list/description of the specific data elements needed to support project goals	X	X		PQAPP Section 3.1, Table 3-1 and specifically rows under 2. Ecological and Health Risk Data and 3. Water Quality and Discharge Data. Data elements include national or state regulations, threshold or limits of constituents of concern; concentration of constituents of concern in effluent and receiving streams, receiving stream sediments, and treatment residuals. These data elements may come from government reports, EPA reports, and peer-reviewed literature. Data elements collected for model identification are discussed in Section 3.1.2 of the PQAPP: Models (p. 43)
Description of the scope of the data elements that you need (e.g., data supporting specific treatment options vs. the full range of options, data supporting the entire country vs. a specific geographic region)	X	X		PQAPP Section 3.1.1: Data elements for this project span the entire country.
If project includes development or update of a project database, QAPP identifies and defines each database field			X	

QAPP Element	Sufficiently Addressed in PQAPP	Additional Detail Needed in Checklist	Not Applicable to Project	Explanatory Comments
B2. Potential Data Sources				
Identifies and describes potential sources of the existing data needed (e.g., photographs, topographical maps, facility or state files, census data, meteorological data, publications, etc.) and the rationale for their use	X	X		PQAPP Section 3.1.2 including data compiled by EPA WACOR and information compiled under previous Abt environmental work assignments. Additional sources include peer-reviewed literature and government publications, include state governments.
If literature searches are used, describes the search engines that will be used and key search terms	X			PQAPP Section 3.1.2. Key word selection and search engines described on p. 41.
If databases or models will be used, describe the database (or model) in terms of who developed it and operates it and the type of data it contains	X			PQAPP Section 3.1.2. Data set and model identification on p. 42-43.
For other potential sources, describe the potential sources & rationale for considering or using each one	X	X		Additional data sources are not foreseen at this time, contractor will discuss with EPA WACOR if additional data sources are needed beyond those outlined in PQAPP Section 3.1.2.
B3. Criteria for Selecting Data Sources				
Identifies each criterion that will be used to determine if the candidate data sources listed in B2 will meet your needs, and how each criterion is defined. (Criteria vary by project; examples include reliability, age, applicability, quantity, format, and others)	X	X		<p>PQAPP Section 3.1.3, Criteria for Selecting Data Sources; data sets (p. 46) and models (p. 47). These will be discussed with EPA WACOR, as mentioned in the PQAPP, and recorded via the monthly QA reports. EPA anticipates data will be gathered from peer-reviewed articles in addition to government and EPA reports. Per p. 46 of PQAPP, EPA WACOR and Abt project team will meet to discuss the identified existing data sources for each project. Through discussion, EPA WACOR will determine whether sufficient relevant and reliable data sources exist, and whether those sources contain sufficient data for intended use.</p> <p>PQAPP Section 3.3.1 (p.55) Abt reviews other data sources to identify potential biases or other data quality issues and communicate these data quality issues and then discuss the best approach to address the issues.</p> <p>After discussion of data sources, WA-specific data needs and possible sources may be covered in SQAPP.</p>

QAPP Element	Sufficiently Addressed in PQAPP	Additional Detail Needed in Checklist	Not Applicable to Project	Explanatory Comments
Explains rating system used to evaluate source against each criterion	X	X		PQAPP Section 3.1.4. If, after discussion on peer-reviewed articles as data sources, EPA and WACOR determine SQAPP is needed, SQAPP will define rating system for evaluating peer-reviewed articles as data sources.
B4. Data Value Selection Approach				
For data sources that meet the criteria identified in B3: Describes the criteria and procedures that will be used to determine which value(s) identified in the acceptable sources are most appropriate for use in the project	X	X		PQAPP Section 3.1.4. p. 49: Abt will investigate range of values found and work with EPA WACOR to determine approach to use for multiple acceptable values. If SQAPP is needed for additional data sources, criteria will be delineated in the SQAPP for those specific data sources.
For data that do not meet these pre-established criteria but are the only data available, explains how the decision to use such data will be made and documented	X	X		PQAPP Section 3.1.4; Communication with EPA WACOR in bi-weekly check-ins and general review by the EPA WACOR upon delivery of final documentation. If it is the only data we have and provides needed context for potential environmental impacts, it will be included.
B5. Resolving Data Gaps				
Describes the process for identifying and addressing data gaps that still exist after candidate data sources have been evaluated and appropriate data values have been identified	X	X		PQAPP Section 3.1.5. Discussion of data gaps with EPA WACOR, but not imputation or resolving of data gaps anticipated.
Describes the process that will be used to address any new data needs revealed during the data gathering process (i.e., additional data elements not previously considered)	X	X		PQAPP Section 3.1.5. Discussion of new data needs that arise with EPA WACOR, but resolving data gaps not anticipated.
B6. Data Gathering Documentation and Records				
Describes how results of the source selection and the data value selection will be documented, including any sources or values that were rejected and the rationale for not using them	X			PQAPP Section 3.1.6 (p. 51-52).
For data that are deemed acceptable and that will be used, explains how each data element will be associated to its original source citation (i.e., bibliographic information, telephone contact reports, email messages, etc.)	X			PQAPP Section 3.1.6 (p. 51-52).
C1. Standardization of Data Elements				
Describes the process to ensure that units and other key measures are captured and standardized (or otherwise made comparable) in the database	X			PQAPP Section 3.2.1 temporal, spatial, chemical.

QAPP Element	Sufficiently Addressed in PQAPP	Additional Detail Needed in Checklist	Not Applicable to Project	Explanatory Comments
If the project requires that all fields be standardized to a single set of units (e.g., US dollars for economic data, µg/L for chemical data), identifies the standard units that will be required for each data element	X	X		PQAPP Section 3.2.1; specifically radionuclide data should be standardized to pCi/L or pCi/g units. Chemical data should be standardized to µg/L to mg/L depending on the constituent, in discussion with the EPA WACOR.
Identifies the procedures for converting data reported in other units to the standardized units, including any rounding or truncating procedures, and procedures for ensuring these conversions are performed correctly	X			PQAPP Section 3.2.1. p. 53 As needed, convert data using universal conversion factors.
If standardization of data elements is not needed, explains the process for ensuring that data presented in varying units are comparable enough for use in the project and that project staff members and other data users will be able to readily identify differences in units	X	X		PQAPP Section 3.2.1; If data for chemical constituents are presented together and not standardized (e.g. using only one unit results in visual difficulties for a table), as many data points as possible should be standardized to one chemical unit (µg/L or mg/L), and the exceptions should be noted.
C2. Data Entry				
Explains the process for manually entering selected data into the project database, who will be responsible for such data entry, and the QC strategies that will be used to ensure that the database accurately and completely captures the data as presented in the original source	X			PQAPP Section 3.2.2 Abt Associates WAM responsible, see A4.
C3. Merging or Uploading Electronic Data from Existing Sources				
If data are available electronically and will be uploaded or merged into the project database: describes the procedures that will be followed to ensure that errors are not introduced during the upload/merge process and that the final database reflects the original dataset(s)	X			PQAPP Section 3.2.3
C4. Data Review				
Describes the process for ensuring that the data have been recorded, transmitted, and processed correctly	X			PQAPP Section 3.2.4; Appendix F
C5. Data Storage and Manipulation				
Describes how the existing data will be stored	X			PQAPP Section 3.2.5
Describes who will be responsible for access to and maintenance of the stored data	X			PQAPP Section 3.2.5
Describes how the existing data will be incorporated with other project data to support the project goal/decision to be made	X			PQAPP Section 3.2.5
Describes the QC strategies that will be employed to ensure that the integrity of the data is not compromised during data storage, access/retrieval, updates, or other manipulation	X			PQAPP Section 3.2.5

QAPP Element	Sufficiently Addressed in PQAPP	Additional Detail Needed in Checklist	Not Applicable to Project	Explanatory Comments
D1. Data Quality Verification and Data Quality Reporting				
Describes the process for verifying that the final set of data meets the overall criteria originally specified for the project	X			PQAPP Section 3.3 and 3.3.1 (p. 55). EPA WACOR reviews data, limitations and gaps identified are discussed. Abt Associates evaluate against objectives.
Describes how these determinations will be documented and reported	X			PQAPP Section 3.3.1 Abt will report outcome to EPA WACOR in meetings or short written deliverables, as needed.
For data that don't meet the pre-established specifications, explains the process for determining if they are usable and how such decisions will be documented	X	X		PQAPP Section 3.3.1; As stated in PQAPP, discussions with EPA WACOR on data quality assessment on data quality verification from peer reviewed literature data sources.
D2. Use/Analysis of the Existing Data				
Provides details regarding the exact means in which the data will be used to meet project objectives	X	X		To show how observed concentrations of constituents of concern compare to current regulatory limits or thresholds, or to observed problematic levels.
Includes an explanation or list of the information to be calculated and the data elements that will be used to make those calculations	X	X		No calculations will be made systematically from existing data at this point in the project.
Includes applicable calculations and equations (if known) or explanations of how they will be developed	X	X		No calculations will be made systematically from existing data at this point in the project.
Includes plans for excluding outliers	X	X		No calculations will be made systematically from existing data at this point in the project.
D3. Methodology Documentation and Conceptual Review				
If exact methodologies for analyzing the data will need to be developed or modified during the course of data analysis, explains the process by which such methodologies will be documented, who is responsible for reviewing/approving their use, and how the methodologies will be checked to ensure they yield the desired products	X	X		PQAPP 3.2.3; PQA Advisor is responsible, see A4 for listed reviewer. Discussion with EPA WACOR as needed.
D4. Technical Review of the Data Analysis				
Describes activities that will be used to ensure the data analyses are being implemented as specified and will support project objectives	X	X		PQAPP 3.3.4; appendix A; PQA Advisor is responsible, see above for listed reviewer. Discussion with EPA WACOR as needed.
Explains procedures for identifying and notifying appropriate personnel if changes to the originally planned procedures are warranted, and the process for approving, documenting and implementing such changes	X	X		PQAPP 3.3.4; appendix A; PQA Advisor is responsible, see A4 for listed reviewer. Discussion with EPA WACOR as needed.

QAPP Element	Sufficiently Addressed in PQAPP	Additional Detail Needed in Checklist	Not Applicable to Project	Explanatory Comments
D5. Final Verification of Data Analysis and Reconciliation with User Requirements				
Describes the process for reviewing the final work product to ensure that the work was generated in accordance with the QAPP, and that the work product addresses the overall project goals and objectives	X	X		PQAPP 3.3.5; Appendix A, PQA Advisor and Abt WACOR , see A4 for listed PQA Advisor and WACOR.
Describes how the results of this assessment will be documented	X			PQAPP Section 3.3.5
Describes how any limitations of the data or data analyses that were used to prepare the final work product will be documented and communicated	X			PQAPP Section 3.3.5

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment						Work Assignment Number 3-54				
						<input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:				
Contract Number EP-C-13-039			Contract Period 09/11/2013 To 07/31/2017 Base Option Period Number 3			Title of Work Assignment/SF Site Name Environmental Impact Support				
Contractor ABT ASSOCIATES INC.					Specify Section and paragraph of Contract SOW B.1, B.3, B.4, C.1, G					
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input checked="" type="checkbox"/> Work Plan Approval					Period of Performance From 11/28/2016 To 07/31/2017					
Comments: This WP is approved with the confirmation from Abt that in the first bullet on the bottom of page 3, should read "environmental analyses" vice "economic analyses".										
<input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund										
SFO <input type="checkbox"/> Note: To report additional accounting and appropriations date use EPA Form 1900-69A.										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										
Authorized Work Assignment Ceiling										
Contract Period:		Cost/Fee: \$0.00				LOE: 0				
09/11/2013 To 07/31/2017										
This Action:		\$53,933.00				460				
Total:		\$53,933.00				460				
Work Plan / Cost Estimate Approvals										
Contractor WP Dated:		12/20/2016		Cost/Fee \$53,933.00		LOE: 460				
Cumulative Approved:				Cost/Fee \$53,933.00		LOE: 460				
Work Assignment Manager Name Emily Trentacoste						Branch/Mail Code:				
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;">(Signature)(Date)</div>						Phone Number: 202-566-0703				
						FAX Number:				
Project Officer Name Ahmar Siddiqui						Branch/Mail Code:				
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;">(Signature)(Date)</div>						Phone Number: 202-566-1044				
						FAX Number:				
Other Agency Official Name						Branch/Mail Code:				
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;">(Signature)(Date)</div>						Phone Number:				
						FAX Number:				
Contracting Official Name Tammy Adams						Branch/Mail Code:				
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;">(Signature)(Date)</div>						Phone Number: 513-487-2030				
						FAX Number: 513-487-2545				

Digitally signed by TAMMY ADAMS
 DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS,
 dnQualifier=0000018417
 Date: 2017.01.04 08:12:51 -05'00'

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment		Work Assignment Number 3-54								
		<input type="checkbox"/> Other <input checked="" type="checkbox"/> Amendment Number: 000001								
Contract Number EP-C-13-039	Contract Period 09/11/2013 To 07/31/2017	Title of Work Assignment/SF Site Name								
	Base Option Period Number 3	Environmental Impact Support f								
Contractor ABT ASSOCIATES INC.		Specify Section and paragraph of Contract SOW B.1, B.3, B.4, C.1, G								
Purpose: <input type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input checked="" type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input type="checkbox"/> Work Plan Approval		Period of Performance From 11/28/2016 To 07/31/2017								
Comments:										
<input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund										
SFO <input type="checkbox"/> Note: To report additional accounting and appropriations data use EPA Form 1900-69A. (Max 2)										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										
Authorized Work Assignment Ceiling										
Contract Period:		Cost/Fee:		LOE: 460						
09/11/2013 To 07/31/2017				0						
This Action:										
Total:				460						
Work Plan / Cost Estimate Approvals										
Contractor W/P Dated:				Cost/Fee		LOE:				
Cumulative Approved:				Cost/Fee		LOE:				
Work Assignment Manager Name Emily Trentacoste						Branch/Mail Code:				
_____ (Signature) (Date)						Phone Number: 202-566-0703				
						FAX Number:				
Project Officer Name Ahmar Siddiqui						Branch/Mail Code:				
_____ (Signature) (Date)						Phone Number: 202-566-1044				
						FAX Number:				
Other Agency Official Name						Branch/Mail Code:				
_____ (Signature) (Date)						Phone Number:				
						FAX Number:				
Contracting Official Name Noelle Mills						Branch/Mail Code:				
_____ (Signature) (Date)						Phone Number: 513-487-2171				
						FAX Number:				

**WORK ASSIGNMENT 3-54
Amendment 1**

I. Title: Environmental Impact Support for the Study of Centralized Waste Treatment

Contractor: Abt Associates

Contract No.: EP-C-13-039

II. Work Assignment Number: 3-54

III. Estimated Period of Performance: Upon Issuance to July 31, 2017

IV. Estimated Level of Effort: 0

V. Key EPA Personnel:

Work Assignment Contracting Officer Representative (WACOR):

Emily Trentacoste
OST/EAD (4303T)
202/566-0703
202/566-1053 (fax)

Alt. Work Assignment Contracting Officer Representative (WACOR):

Karen Milam
OST/EAD (4303T)
202/566-1915
202/566-1053 (fax)

VII. Purpose of the Amendment

The purpose of this amendment is to add an alternative Work Assignment Contracting Officer Representative: Karen Milam.

CONTRACTING OFFICER'S REPRESENTATIVE (COR) APPOINTMENT MEMORANDUM

Date: July 19, 2016

To: Karen Milam

From: Tammy Adams

Subject: CONTRACTING OFFICER'S REPRESENTATIVE (COR) APPOINTMENT WORK
ASSIGNMENT COR FOR EP-C-13-039 OPTION PERIOD III

You are hereby delegated authority to act as a Level II. Work Assignment Contracting Officer's Representative (WA COR) for EP-C-13-039, Option Period III. As such your duties are to assist the Contracting Officer (CO) in the monitoring and oversight of the technical and programmatic aspect of this contract through performance and closeout. This delegation may not be changed unless written authorization is given by the Contracting officer. As a COR you may be personally liable for unauthorized acts or commitments. "Unauthorized commitment," as used in this section, means an agreement that is not binding solely because the Government representative who made it lacked the authority to enter into that agreement on behalf of the Government. As the COR, you must represent the CO within the scope of the following authority, responsibilities, and limitations:

AUTHORITY:

As COR, you have the authority to:

- ✓ 1. Perform surveillance of the contract work and conduct inspections that are necessary to assure compliance with the contract terms and conditions. Resolve day-to-day matters within the scope of your authority.
- ✓ 2. Perform inspection(s) necessary for the acceptance of deliverables (including contract line items numbers (CLINs) and as stated in the contract and to require the contractor to correct any deficiencies.
- ✓ 3. Assist the contractor in interpreting the contract specifications or technical requirements provided that any interpretation or clarification that he COR provides is within the limitations prescribed late in this delegation
- ✓ 4. Certify invoices for payment.

RESPONSIBILITIES:

As COR, you have the following responsibilities as checked:

- ✓ 1. Be familiar with and understand contract requirements (SOW, specification, CLINs and work-break-down structure) and implications of contractor performance in relation to the contract requirements.

2. Assist the CO in developing a contract management plan, finalizing it with the contractor and executing it.

3. Establish a technical performance review program for evaluation of the contractor's work in accordance with the contract terms, conditions, and specifications.

✓ 4. Be familiar with appropriate sections of the FAR, EPAAR and other Agency guidelines and provide insights to the CO on technical requirements and issues.

✓ 5. Maintain a complete working file of all correspondence (or data), including but not limited to invoices initiated or received by you in connection with subject contract.

6. Serve as a member of the negotiation team (as a consultant to the CO) during negotiations by reviewing and evaluating the technical aspects of Contractor proposals and furnishing evaluation comments and recommendations to the CO.

✓ 7. Monitor the contractor's performance of the technical requirements of the contract and notify the CO in writing of any indication that the terms of the contract are not being met.

✓ 8. Inspect contract deliverables for conformance to the contract specifications and accept or reject them.

✓ 9. Maintain direct communications with the contractor and the CO. Serve as the liaison through which the contractor can relay questions and problems of a technical nature to the CO. Meet with the contractor or its designated representative on a periodic basis to keep the lines of communication open.

✓ 10. Draft technical portions of CO letters to the contractor as requested by the CO.

✓ 11. Advise the CO on contractual matters of a technical nature.

✓ 12. Recommend needed change order to the CO when in the best interest of the government including Engineering Change Proposals (ECPs) and Value Engineering Change Proposals (VECPs).

✓ 13. Inform the CO as to the status and progress of performance under the contract and alert the CO to any potential or existing problems.

✓ 14. Monitor the contractor's use of key personnel and notify the CO of any changes in key personnel proposed by the contractor.

✓ 15. Review the qualifications of proposed subcontractors and the appropriateness of subcontracting work and make recommendations to the CO regarding consent to the placement of subcontractors.

✓ 16. Practice claims avoidance, halting unspecified accelerated production and/or directions of other government employees.

- ✓ 17. Perform timely approval of invoices to ensure Prompt Payment of those invoices
- ✓ 18. Evaluate all payment requests (e.g. advance , progress, etc...) based on costs/price incurred and actual work accomplished during invoice certification
- ✓ 19. Promptly notify the CO when absence, (e.g. on leave, emergency, etc...) and Alternate COR is not available to ensure prompt payment of invoices
- ✓ 20. Input, retrieve and analyze past performance evaluation report into the Contractor Performance Assessment Reporting System (CPARS) or as otherwise requested by the CO.
- ✓ 21. Review all contractor-furnished reports, including monthly progress reports and earned value management reports when appropriate.
- ✓ 22. Submit reports, such as the Quality Assurance Surveillance Report, the CO requires to perform their duties.
- ✓ 23. Ensure that EIT products or services, produced, or delivered by contractors or consultants meet applicable Section 508 accessibility standards or notify the CO when they are not in compliance before acceptance.
- ✓ 24. Ensure appropriate confidentiality of contractor submissions bearing proprietary markings.
- ✓ 25. Coordinate with the CO to ensure support contractors have signed nondisclosure forms.
- ✓ 26. Ensure administration of government-furnished property
- ✓ 27. Furnish the CO requests for waivers (whether generated by government or contractor personnel) along with supporting paperwork.
- ✓ 28. Monitor the contractor's compliance with safety and security requirements.
- ✓ 29. Conduct business with industry, in accordance with EPA Oder 1900.1A Interacting with Contractors and the EPA Vendor Communication Plan.
- ✓ 30. Maintain a professional relationship with the contractor at all times.
- ✓ 31. Ensure contractor completion of yearly security awareness training.
- ✓ 32. Provide the CO a copy of all technical correspondence with the contractor.
- ✓ 33. For WA/TO/DO CORs, maintain copies of all deliverables received under the tasking document. This file is considered a segment of the official contract file and should be forwarded to the CO/CS at the final closeout of the contract.
- ✓ 34. Obtain and maintain a listing of employees who will be working at the site. The list is to be kept current by assuring that employees are added and deleted from the list as appropriate. This is important to the security of the facility and your list may be used as a basis

for background checks by the security office in the relevant location. A copy of this list must be provided to the security office at least quarterly, and at any time a contractor employee is added or deleted from the list.

- ✓ 35. Complete mandatory training required for the appointed COR level. FAC-COR certifications are valid for two years from the date of FAITAS certification.
- ✓ 36. Seek guidance from the CO for specific situations not covered in this
- ✓ 37. Report any observed fraud, waste or inefficiencies to the CO.
- ✓ 38. Report through normal administrative channels to Agency Inspector General (IG) and to the CO, any evidence of prime or subcontractor kickback, attempt to bribe, or other fraudulent behavior.

LIMITATIONS:

As COR, you may not:

- ✓ 1. Make or give the appearance of being able to make contractual commitments outside the scope of the contract or execute or agree to modifications or take actions that would commit the Government to a change in contract price, quality, quantity, or delivery schedule.
- ✓ 2. Sign any changes or modifications to contracts and/or task order /delivery order(s).
- ✓ 3. Make determinations regarding issues of Contractor liability that may arise during contract performance. Such issues should be referred to the Contracting Officer.
- ✓ 4. Authorize the purchase or lease of Government-Furnished property.
- ✓ 5. Conduct negotiations or bind the Government by making any written or oral agreements with the contractor.
- ✓ 6. Directly or indirectly change the following:
 - Pricing , cost or fee;
 - Scope of the contract ore work assignment
 - Delivery schedule or period of performance;
 - Labor mix or level of effort; or any other terms/conditions of the contract or work assignment
- ✓ 7. Take part in a labor controversy or dispute involving the Contractor or its employees.
- ✓ 8. Direct the Contractor on how to perform the work.
- ✓ 9. Issue stop-work orders.
- ✓ 10. Supervise Contractor employees implicitly or explicitly which could constitute personal services.

- ✓ 11. Engage in conduct prejudicial to the Government.
- ✓ 12. Use public office for gain.
- ✓ 13. Impede Government efficiency or economy.
- ✓ 14. Lose independence or impartiality.
- ✓ 15. Make a Government decision outside official channels.
- ✓ 16. Affect adversely the public's confidence in the Government.

ACKNOWLEDGMENT STATEMENT

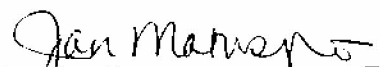
Please acknowledge receipt and acceptance of this appointment by signing and returning the attached sheet to the CO. Your appointment as the COR under the above numbered contract is terminated upon receipt of a written notice of termination from the appointing CO, the CO's successor, or a higher level of authority, or upon completion of the contract.

The duties and responsibilities set forth herein are not intended to be all-inclusive. As COR, you are required to consult with the CO when there are questions related to your authority. You are not authorized to redelegate your authority. If you have any questions concerning your role as COR, please contact the CO at 513-487-2030.

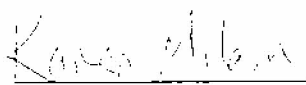
I understand and accept my appointment as a Level II, Work Assignment Contracting Officer's Representative (WA COR) for EP-C-13-039 Option Period III, as outlined in this letter.



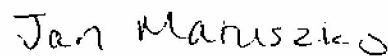
Signature of COR



Signature of COR Supervisor



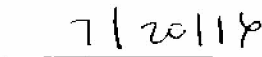
Print Name of COR



Print Name of COR Supervisor



Date



Date

Tammy Adams
Signature of Appointing CO

Date

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment		Work Assignment Number 3-54	
		<input type="checkbox"/> Other <input checked="" type="checkbox"/> Amendment Number: 000002	
Contract Number EP-C-13-039	Contract Period 09/11/2013 to 07/31/2018		Title of Work Assignment/SF Site Name
	Base	Option Period Number 3	Environmental Impact Support #
Contractor ABC ASSOCIATES INC.		Specify Section and paragraph of Contract SOW B.1, B.3, B.4, C.1, G	
Purpose: <input type="checkbox"/> Work Assignment <input checked="" type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Work Plan Approval		<input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Incremental Funding Period of Performance From 11/28/2016 To 07/31/2017	
Comments: Amendment 3 will delete Task 3 from the work assignment and add LOE to Task 4 within the current scope of the work plan. EPA WACOK has determined that Task 3 is no longer necessary.			
<input type="checkbox"/> Superfund		Accounting and Appropriations Data	
		<input checked="" type="checkbox"/> Non-Superfund	
Note: To report additional accounting and appropriations data use EPA Form 1900-69A. SFO (Max 2) <input type="checkbox"/>			
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)
			Budget Org/Code (Max 7)
			Program Element (Max 9)
			Object Class (Max 4)
			Amount (Dollars)
			(Cents)
			Site/Project (Max 8)
			Cost Org/Code
1			
2			
3			
4			
5			
Authorized Work Assignment Ceiling			
Contract Period 09/11/2013 To 07/31/2018		Cost/Fee: LOE 460	
This Action		-112	
Total:		348	
Work Plan / Cost Estimate Approvals			
Contractor WP Dated		Cost/Fee LOE	
Cumulative Approved:		Cost/Fee LOE	
Work Assignment Manager Name Emily Trentacoste		Branch/Mail Code:	
(Signature) _____ (Date) _____		Phone Number: 202-566-0703	
		FAX Number:	
Project Officer Name Ahmar Siddiqui		Branch/Mail Code:	
(Signature) _____ (Date) _____		Phone Number: 202-566-1044	
		FAX Number:	
Other Agency Official Name Nicholas Bisher		Branch/Mail Code:	
(Signature) _____ (Date) _____		Phone Number:	
		FAX Number:	
Contracting Official Name Noelle Mills		Branch/Mail Code:	
(Signature) <i>Noelle Mills</i> (Date) 1/6/17		Phone Number: 513-487-2171	
		FAX Number:	

**WORK ASSIGNMENT 3-54
Amendment 2**

I. Title: Environmental Impact Support for the Study of Centralized Waste Treatment

Contractor: Abt Associates

Contract No.: EP-C-13-039

II. Work Assignment Number: 3-54

III. Estimated Period of Performance: Upon Issuance to July 31, 2017

IV. Estimated Level of Effort: -112

V. Key EPA Personnel:

Work Assignment Contracting Officer Representative (WACOR): Emily
Trentacoste
OST/EAD (4303T)
202/566-0703
202/566-1053 (fax)

Alt. Work Assignment Contracting Officer Representative (WACOR): Karen
Milam
OST/EAD (4303T)
202/566-1915
202/566-1053 (fax)

VII. Purpose of the Amendment

The purpose of this amendment is to remove **Task 5 – Support for CWT Rulemaking Environmental Assessment Analyses**, and to shift additional level of effort to completion of **Task 4 – CWT Study Environmental Impacts Discussion**. This amendment is being driven by the request of the EPA WACOR. The timeline for future work pertaining to Task 5 has been delayed, thus Task 5 is no longer necessary at this time, i.e. the estimated LOE for Task 5 is now zero. In order to conduct a more thorough completion of Task 4, but within the scope of the current work plan, additional LOE will be shifted to Task 4. The current work plan's LOE is 460 hours, with 212 allotted for Task 5. This amendment will reduce the total number of hours to 348, and shift 100 hours from Task 5 to Task 4 (460 hours – 212 hours from Task 5 + 100 hours to Task 4). No changes will be made to the schedule or deliverables for Task 4.

EPAUnited States Environmental Protection Agency
Washington, DC 20460**Work Assignment**

Work Assignment Number

3-54

☐

Other

☒

Amendment Number

000003

Contract Number
EP-C-13-039

Contract Period 09/11/2013 To 07/31/2018

Title of Work Assignment/SF Site Name

Base

Option Period Number 3

Environmental Impact Support f

Contractor

ABT ASSOCIATES INC.

Specify Section and paragraph of Contract SOW

B.1, B.3, B.4, C.1, G

Purpose:

☐

Work Assignment

☐

Work Assignment Close-Out

☒

Work Assignment Amendment

☐

Incremental Funding

☐

Work Plan Approval

Period of Performance

From 11/29/2016 To 07/31/2017

Comments:

This amendment will add 60 zero-cost hours to the work assignment. This amendment will not affect the cost, timeline, or deliverables.

☐

Superfund

Accounting and Appropriations Data

☒

Non-Superfund

SFO
(Max 2)☐

Note: To report additional accounting and appropriations data use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee:

LOE: 348

09/11/2013 To 07/31/2018

This Action:

60

Total:

408

Work Plan / Cost Estimate Approvals

Contractor WP Dated:

Cost/Fee

LOE:

Cumulative Approved:

Cost/Fee

LOE:

Work Assignment Manager Name Emily Trentacoste

Branch/Mail Code:

Phone Number: 202-566-0703

FAX Number:

(Signature)

(Date)

Project Officer Name Ahmar Siddiqui

Branch/Mail Code:

Phone Number: 202-566-1044

FAX Number:

(Signature)

(Date)

Other Agency Official Name Nicholas Bisher

Branch/Mail Code:

Phone Number:

FAX Number:

(Signature)

(Date)

Contracting Official Name Noelle Mills

Branch/Mail Code:

Phone Number: 513-487-2171

FAX Number:

(Signature)

(Date)

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment						Work Assignment Number 3-56				
						<input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:				
Contract Number EP-C-13-039			Contract Period 09/11/2013 To 07/31/2017 Base Option Period Number 3			Title of Work Assignment/SF Site Name Development of Economic Analys				
Contractor ABT ASSOCIATES INC.					Specify Section and paragraph of Contract SOW A.2.2					
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input type="checkbox"/> Work Plan Approval						Period of Performance From 03/08/2017 To 07/31/2017				
Comments: Development of Economic Analyses for California Statewide Water Quality Plans										
<input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund										
SFO <input type="checkbox"/> Note: To report additional accounting and appropriations date use EPA Form 1900-69A. (Max 2)										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										
Authorized Work Assignment Ceiling										
Contract Period:		Cost/Fee:				LOE: 0				
09/11/2013 To 07/31/2017										
This Action:						895				
Total:						895				
Work Plan / Cost Estimate Approvals										
Contractor WP Dated:				Cost/Fee			LOE:			
Cumulative Approved:				Cost/Fee			LOE:			
Work Assignment Manager Name Ghulam Ali							Branch/Mail Code:			
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;"> (Signature) (Date) </div>							Phone Number: 202-566-1004			
							FAX Number:			
Project Officer Name Ahmar Siddiqui							Branch/Mail Code:			
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;"> (Signature) (Date) </div>							Phone Number: 202-566-1044			
							FAX Number:			
Other Agency Official Name							Branch/Mail Code:			
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;"> (Signature) (Date) </div>							Phone Number:			
							FAX Number:			
Contracting Official Name Noelle Mills							Branch/Mail Code:			
<div style="border-bottom: 1px solid black; width: 100%;"></div> <div style="display: flex; justify-content: space-between;"> (Signature) (Date) </div>							Phone Number: 513-487-2171			
							FAX Number:			

Digitally signed by NOELLE MILLS
 DN: cn=U.S. Government, ou=USEPA, ou=Staff, cn=NOELLE MILLS, dnQualifier=0000044796
 Date: 2017.03.08 09:52:39 -05'00'

Statement of Work
EPA Contract No., EP-C-13-039
Work Assignment # 3-56

TITLE: Development of Economic Analyses for California Statewide Water Quality Plans.

I. Work Assignment Contracting Officer Representative (WACOR)

Ghulam Ali
Standards and Health Protection Division
Office of Science and Technology
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Email ali.ghulam@epa.gov
Phone: 202-566-1004

II. Alternative Work Assignment Contracting Officer Representative (ALT WACOR)

Matthew Mitchell
U.S. EPA Region 9
Water Quality Assessment Section (WTR-2-1)
75 Hawthorne Street
San Francisco, CA 94105

Email: Mitchell.Matthew@epa.gov
Phone: 415-972-3508

III. Level of Effort

895

IV. Duration

Issuance to July 31, 2017

1. DESCRIPTION: The Clean Water Act (CWA) directs States, with oversight by the U.S. Environmental Protection Agency (US EPA) to adopt water quality standards to protect the public health and welfare, enhance the quality of water, and serve the purposes of the act. State standards must include (1) designated uses for all water bodies within their jurisdictions, (2) water quality criteria (referred to as objectives under California law) sufficient to protect the most sensitive of the uses, and (3) an antidegradation policy. States are also required to review their standards once every three years and, as appropriate, modify and adopt standards. The results of this triennial review must be submitted to US EPA and US EPA must approve or disapprove any new or revised standards. Section 303(c) of the CWA directs US EPA to promulgate standards where US EPA has determined that a new or revised standard is not

consistent with the requirements of the CWA or where necessary to meet the requirements of the CWA.

Through the triennial review process, in roundtable discussions and in discussions with US EPA Region 9 staff, it was determined that several standards need to be modified and/or adopted in California. The State Water Resources Control Board (State Water Board) is taking the approach that adopting statewide standards is an efficient use of limited resources and is presently in the process of developing water quality standards for the following pollutants:

1. Development of Cadmium Objectives
2. Development of Nutrient Numeric End-Points for Wadeable Streams

The following are individual descriptions of each of the above listed projects:

1. Cadmium Objectives –Economics Analysis

The State Water Board is developing water quality objects (criteria) and associated implementation plan from Cadmium. National Marine Services (NOAA Fisheries) determined that the Cadmium criteria proposed for the California Toxics Rule were not protective of threatened and endangered species. The current national 304(a) criteria may not be protective of west coast salmonid population. California anticipates working with the United States Geological Survey (USGS) to develop protective water quality objectives and an associated program of implementation. Cost of meeting the water quality objectives for point and non-point sources will need to be evaluated.

Timeline: Draft Water Quality Objectives and amendment language in approximately 12 Months

2. Nutrient Numeric End-Points for Wadeable Streams

The State Water Board is developing amendments to its statewide water quality control plan(s) to control nutrients on a watershed scale. While the final form and specific numerical objectives will not be finalized until 2018, there are default numeric guidelines that can be used now to assess the costs of implementing nutrient controls on a discharge by discharge basis. The early draft amendment structure includes the option of a flexible watershed approach. Entities required to obtain permits that do not participate in the watershed approach would be subject to the default backstop in which reasonable potential and effluent limits would be determined by permitting procedures using a discharger by discharger approach.

The State Water Board staff will need costs assessed for several scenarios:

- Meeting effluent limits based on a deviation from reference approach (default backstop) for both point source dischargers as well as agricultural and non-point dischargers.

- Meeting alternative limits based on best expectations for modified streams using a biological condition gradient (BCG). The BCG is a descriptive model for interpreting change in aquatic ecosystems that describes how ecological indicators change in response to increasing stress. Stressors may include increased nutrient loading, hydro-modification or other ecological stressors.
- Watershed-wide compliance using multiple control mechanisms to prevent or restore river segments that have excessive eutrophication. These elements will include riparian restorations, hydro modification/flow alterations and trading. Cost analysis should include the costs for a third party to verify the efficaciousness of restoration actions – similar to a compensatory mitigation program.

Timeline: Draft outline of regulatory approach and default numeric targets in 6 months.
Final amendments 2018

In 2008, the State Water Board adopted sediment quality objectives and an implementation policy for bays and estuaries in the state (Part 1). Part 1 integrated chemical and biological measures to determine if the sediment dependent biota is protected or degraded as a result of exposure to toxic pollutants in sediment and to protect human health. Part 1 included narrative sediment quality objectives for the protection of aquatic life and human health; identification of the beneficial uses that these objectives are intended to protect; and a program of implementation that contained specific indicators, tools, and implementation provisions to determine if the sediment quality at a station or multiple stations meets the narrative objectives, description of appropriate monitoring programs, and a sequential series of actions that would be initiated when a sediment quality objective is not met including stressor identification and evaluation of appropriate targets. While Part 1 provided that the State Water Board would consider relevant and applicable information in conducting a risk assessment, it did not include standardized and consistent implementation provisions for conducting and evaluating a human health risk assessment.

The State Water Board staff prepared amendments to the state's Water Quality Control Plan for Enclosed Bays and Estuaries: Part 1 Sediment Quality (referred to in this report as either "Part 1" or "the Plan"). The amendments included additional sediment quality objectives and implementation procedures that apply to enclosed bays and estuaries in California. An economic analysis was completed of the amendments in 2011. The State Water Board is updating the sediment quality objectives so that it would result in the narrow addition of a Human Health Risk Assessment Framework to Part 1. Hence, the 2011 analysis (Economic Considerations of Proposed Amendments to the Sediment Quality Plan for Enclosed Bays and Estuaries in California, January 2011) needs to be updated accordingly.

Task 1: Prepare Work Plan and Cost Estimates

The contractor shall prepare the work plan and cost estimates for the tasks below. The workplan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the Contract level Contracting Officer Representative (CL-COR) and the Contracting Officer

(CO) will review the workplan. However, only the CO can approve/disapprove, suggest revisions, or change the workplan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised workplan incorporating the CO's comments, if required.

Task 2: Assess Quality of Literature Search, Data Collection and Analyses

The contractor shall use the contract-wide programmatic quality assurance project plan which was developed under the base period work assignment no. 0-01 of the contract (EP-C-13-039). The contractor shall use this quality assurance plan for the literature search, data collection, and analyses to be conducted under this work assignment. The contractor shall identify the quality of primary and secondary data and models. The contractor shall fulfill the reporting requirements to document the quality of both primary and secondary data used in the cost analysis of the policies regarding bacteria, methylmercury, toxicity and sediment in California. Specifically, the contractor shall identify quality of the monitoring data, and point sources technology data required to meet the criteria. The contractor shall analyze the data quality from the perspective of developing economic estimates that can be used to support EPA's decision-making process with respect to water quality standards. The contractor shall perform QA/QC activities to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.

Task 3: Cost Analysis

To conduct the Economic Analyses for the projects listed above, the contractor shall gather information as directed by the EPA WACOR, in consultation with the State Water Board, and estimate baseline information. The baseline is defined as the conditions that would accrue in the absence of the proposed new water quality objective or proposed new policy. The contractor shall develop the baseline and estimate the incremental cost, i.e., those costs above the baseline cost, for each new or revised objective or policy, or set of objectives and policies, for the particular pollutant or policy as listed above.

The contractor shall identify the proposed issues that are most important in terms of their effect on the economics of the proposed project. Under direction of the EPA WACOR, in consultation with the State Water Board staff, the contractor shall compile a list of proposed reasonable alternatives for each issue identified. The contractor shall then conduct an economic analysis relative to the baseline established above. The contractor shall work with EPA and State Water Board staff to determine the specific scope of each economic analysis, prior to starting work on each economic analysis. The sediment quality objectives plan revisions are not expected to be substantial and hence may not result in substantial changes in the economic analysis conducted in 2011.

The contractor shall evaluate the attainability of the draft policies in all applicable Regions. The contractor shall identify the point and non-point source discharges that might be impacted by the amendment and the costs of compliance for each discharge type in each basin planning area. In addition, the contractor shall identify impacts of non-compliance with the recommended basin plan amendment and the costs of those impacts. If necessary, these measures should include time schedules to achieve compliance.

The contractor shall look at one-time costs and annual costs (including operation and maintenance (O&M) and monitoring) of each alternative, for each issue identified, relative to the baseline costs. For each cost estimated, the contractor shall provide a low and a high cost estimate, so that a range of costs will be provided for each alternative.

Written reports suitable for inclusion as the economics section of the staff reports for the proposed policies shall be produced.

Task 4: Economic Support for Rule and Policy

The contractor shall prepare a summary of the cost analyses performed and of EPA's and the State's evaluation of options and impacts (as applicable) for the rule or policy preamble. The contractor shall provide support in preparing preamble drafts.

Task 5: Provide Technical Support for Policy Making Activities

The contractor shall, based on technical direction given by the EPA WACOR, provide technical support related to economic cost issues associated with the policy, plans and rulemaking. Such support may include responding to EPA or State questions about economic issues on calls, and providing written explanations of contractor analyses as needed. Examples of these tasks include developing economic impacts slides, "one-pagers," and/or writing a briefing document. For this work assignment, the WACOR estimates 5 PowerPoint slides, 10-15 emails responding to EPA staff and management specific analysis questions, 1 conference call per month, and 1 "one-pager" may be needed. The contractor may also be directed to provide support in the review of analyses conducted by EPA and its contractors, providing technical review of materials prepared for the rule or policy making by Agency staff and State, and assist in the development of the rule or policy making record. The contractor shall provide information to be used by EPA or the state to respond to comments and improve economic analyses. Based on a thorough knowledge of the economic analysis, the contractor shall prepare accurate draft technical responses to comments including all relevant citations.

If public meetings in California are held, the contractor shall prepare materials for the public meetings and help answer the public's inquiries about the cost analysis during and after the meetings.

The contractor shall participate in conference calls and will help the EPA Region and the State to respond to enquiries about the economic analysis completed by the contractor.

2. PERFORMANCE STANDARDS AND QUALITY MEASURES:

The following standards will be used to measure performance:

- 1) **Quality of Outputs** - All tasks to be superior quality. The quality of outputs will be measured against similar analyses and work products already performed by EPA. These include the costs methodology, and supporting documentation and analyses for The California Policy for Implementation of Toxics Standards for Inland Surface Waters,

Enclosed Bays, and Estuaries of California, the Great Lakes Water Quality Guidance, the California Toxics Rule, and water quality standards regulations for the States of California, Alabama, Delaware, Idaho, Kansas, and Oregon, and the U.S. Territory of Puerto Rico.

- 2) **Timeliness** - All tasks are to be completed on or ahead of schedule as measured against the acceptance criteria.
- 3) **Ingenuity and Resourcefulness** - New issues are addressed using innovative analyses. Ingenuity and resourcefulness will be measured by the ability to use innovative analyses to address new issues not previously identified in the analyses conducted for the California Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, Great Lakes Water Quality Guidance, California Toxics Rule, as well as the Alabama, California, Delaware, Idaho, Kansas, and Oregon, and Puerto Rico water quality standards rulemakings.
- 4) **Quality Assurance** - All work is to adhere to the Quality Assurance Project Plan for the contract.

Deliverables and Schedule

Deliverables due dates shall be suitable for the timelines noted for each project, i.e., the contractor shall contact the State Water Board staff on the timelines that each economic analysis is needed to be complete in order to fit within the schedule of each project.

Tasks	Schedule
Task 1: Prepare Work Plan and Cost Estimates	Per contract requirements
Task 2: Prepare a Quality Assurance Plan for Literature Search, Data Collection and Analyses	Fifteen days after the workplan approval.
Task 3: Cost Analysis	As directed by the EPA WACOR
Task 4: Economic Support for Rule and policy	As directed by the EPA WACOR
Task 5: Provide Technical Support for Policy Making Activities	As directed by the EPA WACOR

3. TRAVEL

Travel will not be needed to complete this Work Assignment.

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment		Work Assignment Number 3-56 <input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:								
Contract Number EP-C-13-039	Contract Period 09/11/2013 To 07/31/2018 Base Option Period Number 3	Title of Work Assignment/SF Site Name Development of Economic Analysis								
Contractor ABT ASSOCIATES INC.		Specify Section and paragraph of Contract SOW A.2.2								
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input checked="" type="checkbox"/> Work Plan Approval		Period of Performance From 03/08/2017 To 07/31/2017								
Comments										
<input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund										
SFO <input type="checkbox"/> Note: To report additional accounting and appropriations data use EPA Form 1900-69A.										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										
Authorized Work Assignment Ceiling										
Contract Period:		Cost/Fee:		\$0.00		LOE:		0		
09/11/2013 To 07/31/2018										
This Action				\$77,457.00				895		
Total:				\$77,457.00				895		
Work Plan / Cost Estimate Approvals										
Contractor WP Dated		03/22/2017		Cost/Fee		\$77,457.00		LOE: 895		
Cumulative Approved:				Cost/Fee		\$77,457.00		LOE: 895		
Work Assignment Manager Name Ghulam Ali							Branch/Mail Code:			
_____ (Signature) (Date)							Phone Number: 202-566-1004			
_____ (Signature) (Date)							FAX Number:			
Project Officer Name Ahmar Siddiqui							Branch/Mail Code:			
_____ (Signature) (Date)							Phone Number: 202-566-1044			
_____ (Signature) (Date)							FAX Number:			
Other Agency Official Name							Branch/Mail Code:			
_____ (Signature) (Date)							Phone Number:			
_____ (Signature) (Date)							FAX Number:			
Contracting Official Name Noelle Mills							Branch/Mail Code:			
_____ (Signature) (Date)							Phone Number: 513-487-2171			
_____ (Signature) (Date)							FAX Number:			

EPA United States Environmental Protection Agency Washington, DC 20460 Work Assignment		Work Assignment Number 3-58 <input type="checkbox"/> Other <input type="checkbox"/> Amendment Number:								
Contract Number EP-C-13-039	Contract Period 09/11/2013 To 07/31/2018 Base Option Period Number 3	Title of Work Assignment/SF Site Name Economics Support for WQS Rule								
Contractor ABT ASSOCIATES INC.		Specify Section and paragraph of Contract SOW Section VI, Paragraphs 1, 2 and 3								
Purpose: <input checked="" type="checkbox"/> Work Assignment <input type="checkbox"/> Work Assignment Close-Out <input type="checkbox"/> Work Assignment Amendment <input type="checkbox"/> Incremental Funding <input type="checkbox"/> Work Plan Approval		Period of Performance From 07/06/2017 To 07/31/2017								
Comments:										
<input type="checkbox"/> Superfund Accounting and Appropriations Data <input checked="" type="checkbox"/> Non-Superfund										
SFO <input type="checkbox"/> Note: To report additional accounting and appropriations data use EPA Form 1900-69A. (Max 2)										
Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										
Authorized Work Assignment Ceiling										
Contract Period: 09/11/2013 To 07/31/2018		Cost/Fee:		LOE: 0						
This Action:				260						
Total:				260						
Work Plan / Cost Estimate Approvals										
Contractor WP Dated:				Cost/Fee			LOE:			
Cumulative Approved:				Cost/Fee			LOE:			
Work Assignment Manager Name Wendy Hoffman							Branch/Mail Code:			
_____ (Signature)							_____ (Date)			
Project Officer Name Ahmar Siddiqui							Phone Number: 202-564-8794			
_____ (Signature)							_____ (Date)			
Other Agency Official Name							FAX Number: 202-566-1053			
_____ (Signature)							_____ (Date)			
Contracting Official Name Noelle Mills							Branch/Mail Code:			
_____ (Signature)							_____ (Date)			
							Phone Number: 513-487-2171			
							FAX Number:			

STATEMENT OF WORK
Work Assignment 3-58

I. Title: Economics Support for Water Quality Standards Rulemakings

Contractor: Abt Associates

Contract No.: EP-C-13-039

II. Work Assignment Number: **3-58**

III. Performance Period: Upon issuance to July 31, 2017

IV. Estimated Level of Effort: **260 hours**

V. Key EPA Personnel:

Work Assignment Contracting Officer Representative (WACOR) and Task Manager for Subtask 4.2:

Wendy Hoffman

U.S. EPA, Office of Water
1200 Pennsylvania Ave., N.W., 4303T
Washington, DC 20460
Phone: (202) 564-8794
Email: hoffman.wendy@epa.gov

Alternate WACOR and Task Manager for Subtask 4.1:

Michael Trombley

U.S. EPA, Office of Water
1200 Pennsylvania Ave., N.W., 4303T
Washington, DC 20460
Phone: (202) 564-3906
Email : trombley.michael@epa.gov

VI. Background and Purpose

Section 303(c) of the Clean Water Act (CWA) directs states to adopt water quality standards (WQSs) for their navigable waters. Under CWA section 304(a), EPA periodically publishes criteria recommendations for states to use when setting water quality criteria for particular parameters to protect recreational and aquatic life uses of waters. Where EPA has published recommended criteria, states have the option of adopting water quality criteria based on EPA's CWA section 304(a) criteria guidance, modified to reflect site-specific conditions or other scientifically defensible methods. EPA encourages states to consider adopting the agency's published 304(a) recommended criteria into their WQSs. In addition, CWA section 303(c)(4)(B) authorizes the Administrator to determine, even in the absence of a state submission, that a new or revised standard is needed to meet CWA requirements. Any new or revised WQSs must be submitted to EPA for review and approval or disapproval. Whenever EPA disapproves a state's WQS submittal as being inconsistent with the CWA, Section 303(b)(1) to (2) gives the Agency 90 days from the date of disapproval to propose federal regulations, and 190 days from the date of publication of the proposed rule to promulgate final federal WQSs, unless the state takes action in the interim.

Setting criteria in WQSs is based on science. Even though economic factors are not decisive in establishing WQSs, EPA has chosen to conduct economic analyses in support of federal WQS regulations. Generally, the purpose of such an analysis is, at a minimum, to inform the public of the costs associated with the rule, and to ensure that estimates of costs, benefits or other impacts take the point of view of society as a whole, rather than reflect the point of view of a limited set of stakeholders. In some cases, a WQSs rule may be economically significant (have "an annual effect on the economy of \$100 million or more"), in which case, E.O. 12866 requires EPA to conduct a full benefit-cost analysis. Recent examples of states with federal water quality standards rulemakings, where the EPA Administrator determined that a new or revised standard was needed to meet CWA requirements, and EPA conducted an economic analysis, include Florida, California, Washington, Maine, Oregon and Idaho. Only the Florida rule rose to the economically significant level.

To meet the responsibility of developing and promulgating updated aquatic life and aquatic-dependent wildlife criteria for the state WQS identified in Task 4 of this WA, EPA needs to provide information on potential costs and benefits that may be indirectly associated with state implementation of these new criteria. As such, the general purpose of this work assignment is to assess potential costs and benefits that may be indirectly associated with state implementation of these updated site-specific criteria for the state WQSs identified in Task 4.

The contractor shall provide information on potential costs that may be associated with implementation of the rules covered by this work assignment to determine the rules' potential economic impacts. Although EPA's revised WQSs will not independently change any existing NPDES permits, CWA section 303(d) lists or Total Maximum Daily Loads (TMDLs), nor are they independently enforceable, EPA anticipates that the revised WQS may eventually lead to new impaired waters listings or new findings during NPDES permit development of a reasonable potential (RP) for a discharge to cause or contribute to a violation of water quality standards. Potentially incrementally impaired water listings may require associated new TMDLs analyses,

new or revised National Pollution Discharge Elimination System (NPDES) permit conditions for point source dischargers, and/or control requirements or best management practices (BMPs) on other sources (e.g., agriculture, urban runoff, and septic systems). Nonpoint source, watershed-based plans may also be needed to be eligible for CWA Section 319 funding. New RP findings may require new water quality-based effluent limits in NPDES permits. EPA will provide the contractor with the water quality criteria that are part of the WQSs, along with other information regarding how the criteria are to be applied. EPA may also assist with the identification of permits in those states that discharge into waters affected by the promulgation of new WQSs covered by this WA, or that discharge into waters upstream of affected waters, if relevant, for the work under this WA.

The economic analyses are assessments of the potential cost of implementing the new WQSs. The analyses should take into account technologies and other controls that may be used to meet the criteria in waters newly identified as impaired as a result of the new criteria. The economic analyses conducted under this WA represent the difference in estimates of the potential costs between a state's current WQSs and the EPA-revised WQSs. Note that full compliance with current WQSs should be assumed by these analyses.

Under this WA, EPA will conduct an economic analysis for two states. EPA and/or another contractor to EPA may provide information on potential controls and engineering costs that may be associated indirectly with implementation of these revised WQSs. The contractor shall conduct all analyses requiring the collection and transformation of existing (secondary) data and models in accordance with the EPA-approved QAPP which it has developed for WA 5-13 under Contract EP-C-12-006 and amended by letter to cover the analyses in this WA for Missouri and Oregon. The EPA WACOR will provide all technical direction related to this work in writing.

Work conducted under this WA shall not duplicate work conducted under any other .

VI. General Requirements of the Work Assignment

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be clearly identified as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor should refer all interpretations of policy to the EPA WACOR.

Limitation of Contractor Activities: The contractor shall submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts shall clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor shall incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR. The contractor shall adhere to all applicable EPA management control procedures as implemented by the EPA Contracting Officer (CO), EPA Contract Level COR (CL-COR), and EPA WACOR.

Quick Response: Under this work assignment the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working days.

Travel: The contractor may be required to travel under this work assignment. Travel may be to meet with EPA officials to discuss methodology and other important issues associated with the regulatory impact analysis. We estimate up to two trips each requiring one or two contractor personnel, per subtask under Task 4. The EPA WACOR will determine the destination and the activities for which the contractor shall travel, if need arises, in the future. Contractor personnel shall clearly identify their affiliation prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. Request for approval for any travel directly chargeable to this work assignment must be submitted and approved by the CL-COR before travel begins.

Deliverables: The EPA WACOR will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the EPA WACOR's comments. At the close of the WA period, the contractor shall provide EPA with final copies of all records, datasets, documents and project file items associated with Task 4.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters are to be provided in electronic form using Word and/or Excel/Access, ArcView, or, in special cases, another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for a final report. For deliverables that are in Word or pdf versions of Word documents, and that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR.

VIII. Performance Work Statement

Task 1: Prepare Project Budget and Cost Estimates

Estimated LOE hours: 12 hours

The contractor shall prepare a project budget for the tasks below. The project budget shall include the technical approach, resources, timeline and due dates for deliverables; a detailed cost estimate by task; and a staffing plan. The EPA WACOR, the PO and the CO will review the budget. However, only the CO can approve or disapprove, suggest revisions, or change the budget. Official revisions will be given to the contractor by the Contracting Officer. The contractor shall prepare a revised budget incorporating the Contracting Officer's comments, if required.

Deliverables and schedule under Task 1:

1. Project budget is due 15 calendar days after receipt of work assignment.

Task 2: Prepare a Quality Assurance Plan for Literature Search, Data Collection and Analyses

Estimated LOE: 8 hours

2.1 Background

Quality Assurance Project Plans are required under the Agency's Quality Assurance Policy CIO-2105, formerly EPA Order 5360.1 A2 (May 2000), and implementing guidance CIO-2105-P-01-0 (May 2000). All projects that involve the generation, collection, analysis, and use of environmental data must have an approved Quality Assurance Project Plan (QAPP) in place prior to the commencement of the work. Examples of these environmental data operations are provided in Table 2.1 below.

Table 2.1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data	Includes field sampling information (sample location information, flow measurements, temperature, pH, physical observations, etc.), laboratory measurements (e.g., chemical, physical, biological, radiological measurements), data collected from questionnaires, economic data, census data, and any other types of existing data (i.e., data generated for a different purpose or generated by a different organization)
Data generation	Includes field studies, laboratory studies, and generation of modeling output

Table 2.1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data collection	Includes field surveys, questionnaire surveys, literature searches, and third party data
Data evaluation	Includes data inspection, review, assessment, and validation
Data analysis	Includes statistical, engineering, and economic analysis, and testing, evaluation, and validation of methods and models; database creation, data extraction, and data manipulation
Data Use	Any use of data to support EPA decisions, regulations, policy, publications, or tools (including effluent guidelines, 304(m) program, standards, environmental assessments, and models, tools, or reports disseminated by EPA to assist other organizations in implementing environmental programs)

Note that QAPPs are required for the development or revision of models and software that support the generation, collection, evaluation, analysis, or use of data. (A model is set of equations and assumptions used to predict unknown data.) When existing models are used as a tool to generate or evaluate data, the project QAPP must describe the model and explain how it will be used and how its output will be evaluated to ensure the modeling effort meets the overall quality objectives for the project. Development or revision of new models also must be supported by a QAPP that describes the objectives for the model, the quality criteria that will be applied to the model, and the procedures for evaluating whether the model meets those criteria.

2.2 QA Project Plan Requirements

The contractor has previously prepared a QAPP entitled, “Secondary Data Quality Assurance Project Plan for project entitled: Western States Criteria and Rulemaking Support,” for WA 5-13, under Contract EP-C-12-006. The activities in this work assignment involve gathering, evaluating, analyzing, and otherwise using existing environmental data (also known as “secondary” use of data). EPA has determined that the work under this WA may be conducted under this QAPP (with the letter amendment to add Missouri and Oregon to the list of locations to which the QAPP will be applicable), and that the QAPP addresses QA requirements for this work assignment. The current QAPP includes information on:

- Specific objectives of the project(s) supported by this work assignment, including typical questions that must be answered when the contractor is using existing sources of data to perform economic analyses in support of EPA’s promulgation of state WQSs;
- The type of data to be gathered or used under this work assignment to support the project objectives—including data from search engines, federal databases, EPA data bases—as well as a rationale for when those databases are appropriate and what data available in each will support the project;
- The quality objectives needed to ensure the data will support the project objectives; and,
- The QA/QC activities to be performed to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.

Appendix 1 at the end of this PWS contains the QA Checklist for this project, which demonstrates how the QAPP addresses QA requirements for this work assignment. The contractor shall fill in staff roles in the table in the 'explanatory comments' under A.4 and make any additional detailed notes in the explanatory comments column as requested by the WACOR. The contractor shall then include the completed table as a separate Appendix 1 to the project budget upon submittal to EPA. This Appendix 1 should be a stand-alone document if QA documentation is requested. Therefore, the table title must include the title of the WA, WA number, and contract number. The WACOR has provided this information in the title, which the contractor may use to fulfill this requirement.

2.3 Additional QA Documentation Required

The EPA Quality Manual for Environmental Programs (CIO 2105-P-01-0, May 2000) requires published Agency reports containing environmental data to be accompanied by a readily identifiable section or appendix that discusses the quality of the data and any limitations on the use of the data with respect to their originally intended application. The EPA Quality Manual further requires Agency reports to be reviewed by the QA manager (or other authorized official) before publication to ensure that an adequate discussion of QA and QC activities is included. The purpose of the review is to ensure that the reports provide enough information to enable a knowledgeable reader to determine whether the technical and quality goals were met for the intended use of the data. Reports should include applicable statements regarding the use of any environmental data presented as a caution about possible misuse of the data for other purposes. For example, a Technical Support Document or Study Report must include a clear discussion of the quality management strategies (including the project goals and objectives, quality objectives and criteria, and QA/QC practices) that were employed to control and document the quality of data generated and used. These documents should also discuss any deviations from procedures documented in the EPA-approved QAPP(s) supporting the project, the reasons for those deviations, any impact those deviations had on data quality, and steps taken to mitigate data quality issues.

In support of this Agency requirement, all major deliverables (e.g., Technical Support Documents, Study Reports, Analytical Methods) produced by the contractor under this work assignment must include a discussion of the QA/QC activities that were performed to support the deliverable. This discussion must provide a sufficient level of detail to allow the EAD QA Coordinator (or designee) to determine whether the QA/QC strategies implemented for the project sufficiently support the intended use of the data. Upon receipt, the EPA WACOR will review each applicable report and certify whether the contractor has adhered to the QA requirements documented in the contractor's QAPP.

The contractor also shall provide EPA with monthly reports of QA activities performed during implementation of this work assignment. These monthly QA reports shall identify QA activities performed to support implementation of this work assignment, problems encountered, deviations from the QAPP, and corrective actions taken. If desired, the contractor may include this report as a part of the contract-required monthly financial/technical progress report.

2.4 Data Quality Act/Information Quality Guidelines Requirements

The Data Quality Act (also known as the Information Quality Act) requires EPA to ensure that influential information disseminated by the Agency is sufficiently transparent in terms of data and methods of analysis so that the information could be substantially reproduced. To support compliance with these data transparency/data reproducibility requirements, EPA plans to include QAPPs as part of any rulemaking record documentation to be made available to the public. The contractor may claim information in QAPPs as confidential; if the contractor chooses to do so, the contractor shall submit a sanitized (i.e., public) version and an unsanitized (i.e., confidential) version at the time the QAPP is submitted for approval by EPA. The sanitized version shall be included in the public docket for the applicable rulemaking (or other docket record), and the unsanitized version shall be included in a non-public (i.e., confidential) portion of the docket (or record).

Information contained in the approved QAPP shall be transparent and reproducible and meet the requirements of the Data Quality Act for influential information. EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency* (EPA/260R-02-008, October 2002), referred to as "EPA's Information Quality Guidelines," describe EPA procedures for meeting Data Quality Act requirements. Section 6.3 of EPA's Information Quality Guidelines indicates that "especially rigorous robustness checks" should be applied in circumstances where quality-related information cannot be disclosed due to confidentiality issues. Where applicable, the contractor should indicate which results were obtained using the tools (SOPs, checklists, and guidelines) that the contractor designates as confidential so that the EPA WACOR can easily identify the areas that require rigorous robustness checks and document that those checks have been performed. At the discretion of the EPA WACOR, the contractor may be requested to prepare pre-dissemination review checklist as described in Section 5.5 of the Office of Water Quality Management Plan, February 2009. If this is required, the EPA WACOR will notify the contractor through written technical direction.

Deliverables and schedule

1. Monthly reports of QA work performed (may be included in contractor's monthly progress report) due monthly throughout the WA period of performance. The monthly progress report shall breakdown costs by subtask.

Task 3: Adhere to Standardized Naming Convention and Version Control Memorandum

Estimated LOE hours: 0 hours

The contractor shall adhere to the EPA WACOR-approved standardized naming convention and version control (SNCVC) plan which was developed under the Construction and Development WA 0-01 of Contract EP-C-07-023 (WA0-01_T1_SNCVC_08.31.07_V1.pdf). The contractor shall use this standardized convention for all deliverables associated with this work assignment.

Task 4: Economic Analyses

Estimated Total LOE for Task 4: 240 hours

EPA has constructed a flowchart (see Appendix 2) describing the standard process for developing an economic analysis of a WQSs rulemaking, and the roles various parties play; the focus of this work assignment is the economics work, while the engineering work is most likely conducted under another contract. In general, an early step is to determine the baseline for the rule. While this step is sometimes straightforward, it is often complicated when EPA is regulating in place of a state because there may be costs and benefits associated with *achieving* the baseline. The purpose of this WA is not to estimate such costs and benefits because they are not costs and benefits associated with EPA's WQSs rulemaking. There may, however, be instances where estimating baseline costs is a necessary step in estimating incremental costs. The contractor shall estimate baseline costs only in the case where the EPA WACOR issues written technical direction to do so.

Once the baseline is established, the contractor shall determine the availability of the data on ambient water quality monitoring (for ascertaining potentially incrementally impaired waters) and data on point source dischargers (i.e., facilities in industries with demonstrated RP or permit limits for the pollutants for which criteria are being set by the WQSs, and for which RP should be analyzed and the subset for which technology costs should be estimated). The contractor shall at a minimum estimate the administrative costs associated with TMDLs for potentially incrementally impaired waters. Depending on the circumstances, the subtasks below may call upon the contractor to estimate control costs for nonpoint sources, assuming adequate data is available to estimate costs of control for stormwater runoff, agricultural and forestry sources, and septic systems.

While EPA or another contractor will estimate the engineering costs associated with pollution control, the contractor shall convert such engineering capital and O&M costs into a stream of future costs over the life of the technologies, and annualize using both 3% and 7% discount rates. The 3% discount rate estimates will form the basis of EPA's primary estimates of costs, while the 7% discount rate estimates shall be included in an appendix, in order to comply with OMB's Circular A-4 requirements. Unless specifically noted in the subtasks below, the contractor will not analyze the benefits of achieving the WQSs.

The contractor shall use draft EPA criteria documents and any other relevant existing analyses provided by the EPA WACOR, including relevant TMDLs, as a starting point for the economic analyses in the subtasks below. For the economic analyses, the EPA WACOR will provide the contractor with data on point and nonpoint source dischargers located in the states identified in subtasks below that may be affected by the revised aquatic life and aquatic-dependent wildlife criteria, and human health criteria. The point and nonpoint sources may include, but are not limited to: agriculture, forestry, mining, municipal wastewater treatment plants, industrial wastewater, urban storm water, septic systems, and atmospheric deposition.

The EPA WACOR will provide the contractor with data from the Technical Support Document (TSD) on criteria prepared for each of the rulemakings identified in subtasks below. The TSDs

will identify and document a baseline of water quality based on current water quality standards and TMDLs, and then estimate the incremental change needed to meet the new aquatic life and aquatic-dependent wildlife criteria, and human health criteria. These data will include summarized monitoring data and permit limits for the relevant contaminant related to the existing criteria for the contaminant(s), including all relevant water quality data (including monitoring data from environmental and conservation groups) for the contaminant.

If EPA proposes additional options for new human health and/or aquatic life criteria, the EPA WACOR will provide the contractor with estimates of the additional incremental changes and the contractor shall use them to provide new cost estimates. Where appropriate for a particular cost category, the contractor shall provide lower and upper bound estimates.

If specified below, the contractor shall also use the estimated incremental change to estimate benefits of new human health criteria if requested by the EPA WACOR. The contractor shall consider the use of cancer cases and other illnesses avoided. If applicable, the contractor shall use value of a statistical life and treatment costs of avoided illness for the benefits analysis. The contractor shall also estimate any water quality benefits from the incremental change of new aquatic life criteria. If available, the contractor shall present nonuse benefits in addition to the use benefits for the criteria change. If specified below, the contractor also shall present a discussion of qualitative benefits in the TSD.

The following data will be provided to the contractor by the EPA WACOR for each of the economic analyses:

- Baseline criteria.
- NPDES permitted dischargers by facility type (major/minor) and category.
- The potential engineering control costs to municipal and industrial point sources associated with compliance with the revised human health criteria. Compliance costs may result from changes to NPDES permit requirements and associated effluent limitations.
- The cost of any Best Management Practices (BMPs) identified by EPA.

The economic analyses developed under subtasks below shall have the following common elements:

1. An appendix at the back of each EA, modeled on the Washington State EA/TSD which the EPA WACOR will provide. The appendix shall provide the details of the sample facility results (facility-specific details will be provided in the TSD and include the extrapolation of statewide costs for major dischargers under each rule). The contractor shall annualize capital costs, including study costs (e.g., dilution, variance) and program (e.g., pollution prevention) over the assumed life of the equipment using 3% and 7% discount rates to obtain total annual costs per facility. Wherever a range of costs is available, the contractor shall calculate a minimum and maximum annual cost for each facility in the sample and then apply those costs to all other facilities in that category statewide.

2. Where labor cost data are available for pollution prevention (P2) programs for source controls for individual pollutants (e.g., mercury), the contractor shall use the most recent local labor rate data from the Bureau of Labor Statistics (BLS) and update cost components for changing price

levels using the Gross Domestic Product Implicit Price Deflator (GDP-IPD) from the Department of Commerce's Bureau of Economic Analysis.

The contractor shall summarize the unit costs utilized in the sample facility compliance cost analyses for industrial and municipal dischargers that would need to reduce pollutants as a result of the revised criteria.

3. The contractor shall include an Uncertainty and Quality Assurance table containing a description of each potential uncertainty and/or assumption affecting the cost estimate, the effect on the cost estimate (positive, negative, or ambiguous), and any additional notes. The table should be modeled on Exhibit 6-3, Uncertainties in Analysis of Costs, in the "Economic Analysis for Water Quality Standards Applicable to the State of Washington" prepared under Contract # EP-C-13-03.

Only the EPA WACOR has the authority to issue technical direction to the contractor for work under the subtasks. The Task Managers do not have the authority to issue technical direction. The Task Managers named in **V. Key Personnel** will review and provide comments on all deliverables and relay those comments to the EPA WACOR to provide to the contractor. All technical direction issued by the EPA WACOR must be in writing.

Subtask 4.1: Economic Analysis for WQS for Missouri Lakes Numeric Nutrients Criteria

Estimated LOE: 160 hours

The state of Missouri has narrative nutrients criteria for more than 800 of its lakes (the exception is 25 lakes for which numeric nutrients criteria were set by Missouri, and approved by EPA in 2011). Under a court order, EPA will issue federal numeric nutrients criteria for the lakes with narrative nutrients criteria, covering total nitrogen, total phosphorus and chlorophyll-a. Because the pollutants of concern are nutrients, EPA expects that the economic analysis will need to consider, at a minimum, point sources that are POTWs, other point source categories with numeric limits for nutrients (if any), and nonpoint sources associated with agricultural activity. The criteria are likely to apply to waters with drinking water as a designated use, as well as for aquatic life support.

A key step in the analysis will be to ascertain the baseline, and establish a way to estimate which lakes are impaired under the baseline. EPA does not intend to estimate costs associated with improving waters that are impaired under the baseline, unless it is necessary to do so, either as the upper bound on costs, assuming that none of the lakes are impaired under the baseline, or as a courtesy to the public to place the costs of this rule within the context the total cost of all lakes meeting the numeric nutrients criteria. Should it be necessary to estimate baseline costs, the EPA WACOR will issue written technical direction requesting the analysis. The main challenge will be that the state does not have information that would help make this step straightforward.

Under this subtask, the contractor shall develop an Economic Analysis for the proposed WQS for Missouri based on the revised numeric nutrients criteria. The EA shall contain the elements described above under Task 4 of this WA. A draft Economic Analysis shall be provided to the

EPA WACOR via the task manager for an initial review. The EPA WACOR will provide revisions and/or comments to the contractor and the contractor shall incorporate the changes into a revised draft Economic Analysis. All comments will be provided to the contractor through written technical direction by the EPA WACOR. The contractor should expect three sets of significant revisions. After each set of significant revisions, the contractor shall submit draft materials to the EPA WACOR for review. The contractor shall include a description of the QA measures taken in completing this task. Work conducted under this subtask shall not duplicate work conducted under any other WA..

Deliverables and schedule under Subtask 4.1:

4.1a. Draft Economic Analysis for the proposed rule due no later than July 14, 2017 based on technical direction provided by the EPA WACOR.

4.1b. Revised drafts for each set of significant revisions due three calendar days after receipt of written technical direction from the EPA WACOR.

4.1c. Final Economic Analysis for proposed rule due no later than July 31, 2017.

Subtask 4.2: Economic Analysis for WQS for Oregon Aluminum Criteria

Estimated LOE: 80 hours

Aluminum naturally occurs at low levels in surface waters but, at higher concentrations, can be toxic to aquatic life. Activities such as bauxite mining, alumina refining, production of aluminum products, and manufacturing processes can increase levels of aluminum in surface waters. In addition, alum (potassium aluminum sulfate) used in clarification processes in drinking water and wastewater processes, can contribute to levels of aluminum in surface waters.

In 2013, EPA disapproved the state of Oregon's freshwater acute and chronic aluminum criteria. Oregon has not yet adopted and submitted revised freshwater acute and chronic aluminum criteria to EPA, so EPA proposes to establish federal freshwater acute and chronic aluminum criteria that take into account the best available science, EPA policies, guidance and legal requirements, to protect aquatic life uses in Oregon from the effects of exposure to harmful levels of aluminum.

Under this subtask, the contractor shall respond to EPA's comments on the draft EA prepared for EPA under WA 5-13 under contract EP-C-12-006. EPA will provide the contractor with updated draft EPA aluminum criteria documents for aluminum for Oregon, and other updated relevant existing analyses, including relevant TMDLs. The EPA WACOR will provide the contractor with updated information on point and nonpoint source dischargers located in Oregon that may be affected by the aluminum criteria. Given the very small number of point sources, the contractor may not be able to estimate a range of costs.

All comments will be provided to the contractor through written technical direction by the EPA WACOR. The contractor should expect three sets of significant revisions. After each set of significant revisions, the contractor shall submit draft materials to the EPA WACOR for review.

The contractor shall include a description of the QA measures taken in completing this task. Work conducted under this subtask shall not duplicate work conducted under any other WA.

Deliverables and schedule under Subtask 4.2:

4.2a. Draft Economic Analysis for the proposed rule due no later than July 14, 2017 based on technical direction provided by the EPA WACOR.

4.2b. Revised drafts for each set of significant revisions due three calendar days after receipt of written technical direction from the EPA WACOR.

4.2c. Final Economic Analysis for proposed rule due no later than July 31, 2017.

VI. SCHEDULE OF DELIVERABLES:

Task	Deliverable	Due
1	Work Plan	Due within 15 calendar days after WA receipt.
2	Monthly reports of QA work performed	May be included in monthly progress reports.
3	Adhere to SNCVC memorandum	No deliverables under this task.
4.1	EA for Proposed Missouri WQS for nutrients	Draft EA due July 14. Revised drafts due 3 calendar days after receipt of comments from EPA WACOR. Final EA due no later than July 31, 2017.
4.2	EA for Proposed Oregon WQS for aluminum	Draft EA due July 14. Revised drafts due 3 calendar days after receipt of comments from EPA WACOR. Final EA due no later than July 31, 2017.

Appendix 1

QA Checklist for Projects Utilizing Existing Data

The items noted in this checklist are adapted from those elements found in *EPA Requirements for QA Project Plans (QA/R-5)* (EPA, 2001a), but tailored to the use of existing data. Page references are from Secondary Data Quality Assurance Project Plan for project entitled: Western States Criteria and Rulemaking Support,” EPA Contract EP-C-12-006, Work Assignment No. 5-13.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
A1. Title & Approval Sheet							
Project title	X						Page 3
Organization’s name	X						Page 3
Effective date and/or version identifier	X						Page 3
Dated signature of Organization’s project manager	X						Page 3
Dated signature of Organization’s QA manager	X						Page 3
Other signatures, as needed (e.g., EAD Project Officer, EAD QA Coordinator)	X						Pages 3-4
Revision History	X						Page 5
A2. Table of Contents							
Includes sections, figures, tables, references, and appendices	X						Pages 6-7
Document control information indicated (when required by the EPA Project Manager and QA Manager)		X					
A3. Distribution List							
Includes all individuals who are to implement or otherwise receive the QAPP and identifies their organization	X						Page 7
A4. Project/Task Organization							
Identifies key individuals with their responsibilities (e.g., data users, decision makers, project QA manager, Subcontractors, etc.) and contact info.	X						Pages 11

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
Organization chart shows lines of authority & reporting responsibilities	X						Page 11
Project QA manager position indicates independence from unit collecting/using data	X						Page 11
A5. Problem Definition/Background							
Clearly states problem to be resolved, decision to be made, or hypothesis to be tested	X						Pages 7-8
Identifies project objectives or goals	X						Pages 7-8
Historical & background information		X					
Cites applicable technical, regulatory, or program-specific quality standards, criteria, or objectives	X						Pages 7-8
A6. Project/Task Description							
List measurements to be made/data to obtain	X						Page 11
Notes special personnel or equipment requirements		X					Pages 12-13
Provides work schedule		X					Work schedule provided in WA
A7. Overall Quality Objectives & Criteria							
States overall quality objectives and limits needed to support the project goals and objectives cited in Element A5.	X						Page 14
A8. Special Training Requirements/ Certifications							
Identifies specialized skills, training or certification requirements	X						Page 15
Discusses how this training will be provided/the necessary skills will be assured and documented	X						Page 15
A9. Project-level Documents & Records							
Describes process for distributing the approved QAPP and other planning documents (and updates) to staff	X						Pages 15-16

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
Identifies final work products that will result from the project	X						Page 15
Describes the process for developing, reviewing, approving, and disseminating the final work products and individuals responsible for these processes	X						Pages 15-16
B1. Data Needs							
Detailed list/description of the specific data elements needed to support project goals	X						Pages 16-17
Description of the scope of the data elements that you need (e.g., data supporting specific treatment options vs. the full range of options, data supporting the entire country vs. a specific geographic region)	X						Pages 16-17
If project includes development or update of a project database, QAPP identifies and defines each database field							Pages 16-17
B2. Potential Data Sources							
Identifies and describes potential sources of the existing data needed (e.g., photographs, topographical maps, facility or state files, census data, meteorological data, publications, etc.) and the rationale for their use	X						Pages 17-18
If literature searches are used, describes the search engines that will be used and key search terms	X						Pages 17-18
If databases or models will be used, describe the database (or model) in terms of who developed it and operates it and the type of data it contains	X						Pages 17-18
For other potential sources, describe the potential sources and rationale for considering or using each one	X						Pages 18 - 19

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
B3. Criteria for Selecting Data Sources							
Identifies each criterion that will be used to determine if the candidate data sources listed in B2 will meet your needs, and how each criterion is defined. (Criteria vary by project; examples include reliability, age, applicability, quantity, format, and others)	X						Pages 18-20
Explains rating system used to evaluate source against each criterion	X						Pages 18-20
B4. Data Value Selection Approach							
For data sources that meet the criteria identified in B3: Describes the criteria and procedures that will be used to determine which value(s) identified in the acceptable sources are most appropriate for use in the project	X						Pages 18-20
For data that do not meet these pre-established criteria but are the only data available, explains how the decision to use such data will be made and documented	X						Page 20
B5. Resolving Data Gaps							
Describes the process for identifying and addressing data gaps that still exist after candidate data sources have been evaluated and appropriate data values have been identified	X						Pages 20
Describes the process that will be used to address any new data needs revealed during the data gathering process (i.e., additional data elements not previously considered)	X						Page 20.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
B6. Data Gathering Documentation and Records							
Describes how results of the source selection and the data value selection will be documented, including any sources or values that were rejected and the rationale for not using them	X						Pages 20-21 Note – in cases where sources or values were rejected, the EPA WACOR will have the contractor document reasons for rejection.
For data that are deemed acceptable and that will be used, explains how each data element will be associated to its original source citation (i.e., bibliographic information, telephone contact reports, email messages, etc.)	X						Pages 20-21

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
C1. Standardization of Data Elements							
Describes the process to ensure that units and other key measures are captured and standardized (or otherwise made comparable) in the database	X						Page 20
If the project requires that all fields be standardized to a single set of units (e.g., US dollars for economic data, ug/L for chemical data), identifies the standard units that will be required for each data element	X						Page 20
Identifies the procedures for converting data reported in other units to the standardized units, including any rounding or truncating procedures, and procedures for ensuring these conversions are performed correctly	X						Page 20
If standardization of data elements is not needed, explains the process for ensuring that data presented in varying units are comparable enough for use in the project and that project staff members and other data users will be able to readily identify differences in units	X						Page 22 Note -- If standardization of data elements is not needed, the EPA WACOR will ensure that contractor explains the process for ensuring that data presented in varying units are comparable enough for use in the project and that project staff members and other data users will be able to readily identify differences in units.
C2. Data Entry							
Explains the process for manually entering selected data into the project database, who will be responsible for such data entry, and the QC strategies that will be used to ensure that the database accurately and completely captures the data as presented in the original source	X						Pages 20-21

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
C3. Merging or Uploading Electronic Data from Existing Sources							
If data are available electronically and will be uploaded or merged into the project database: describes the procedures that will be followed to ensure that errors are not introduced during the upload/merge process and that the final database reflects the original dataset(s)	X						Pages 20-22
C4. Data Review							
Describes the process for ensuring that the data have been recorded, transmitted, and processed correctly	X						Pages 20-22
C5. Data Storage and Manipulation							
Describes how the existing data will be stored	X						Page 20-21
Describes who will be responsible for access to and maintenance of the stored data	X						Page 20-22
Describes how the existing data will be incorporated with other project data to support the project goal/decision to be made	X						Pages 20-22
Describes the QC strategies that will be employed to ensure that the integrity of the data is not compromised during data storage, access/retrieval, updates, or other manipulation	X						Pages 20-21

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
D1. Data Quality Verification and Data Quality Reporting							
Describes the process for verifying that the final set of data meets the overall criteria originally specified for the project	X						Pages 21-22
Describes how these determinations will be documented and reported.	X						Pages 21-22
For data that don't meet the pre-established specifications, explains the process for determining if they are usable and how such decisions will be documented	X						Pages 21-22
D2. Use/Analysis of the Existing Data							
Provides details regarding the exact means in which the data will be used to meet project objectives	X						Page 22
Includes an explanation or list of the information to be calculated and the data elements that will be used to make those calculations	X						Page 22
Includes applicable calculations and equations (if known) or explanations of how they will be developed.	X						Page 22
Includes plans for excluding outliers.	X						
D3. Methodology Documentation and Conceptual Review							
If exact methodologies for analyzing the data will need to be developed or modified during the course of data analysis, explains the process by which such methodologies will be documented, who is responsible for reviewing/ approving their use, and how the methodologies will be checked to ensure they yield the desired products	X						Page 22

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
D4. Technical Review of the Data Analysis							
Describes activities that will be used to ensure the data analyses are being implemented as specified and will support project objectives	X						Page 22
Explains procedures for identifying and notifying appropriate personnel if changes to the originally planned procedures are warranted, and the process for approving, documenting and implementing such changes	X						Page 22
D5. Final Verification of Data Analysis and Reconciliation with User Requirements							
Describes the process for reviewing the final work product to ensure that the work was generated in accordance with the QAPP, and that the work product addresses the overall project goals and objectives	X						Page 22
Describes how the results of this assessment will be documented	X						Page 22
Describes how any limitations of the data or data analyses that were used to prepare the final work product will be documented and communicated	X						Page 22

Appendix 2

Basic Template for Economic Analysis for Water Quality Standards

Note: The color key for the roles and responsibilities of the engineer and economist, and the discussion and decision points, is matched to the background color immediately around the text in each element of the flow chart.

